



# AMERICAN JOURNAL OF PUBLIC HEALTH *and* THE NATION'S HEALTH

VOLUME 35, 1945

## INDEX

	Pages		Pages
January .....	1- 88	July .....	675- 782
February .....	89-190	August .....	783- 890
March .....	191-298	September .....	891- 986
April .....	299-432	October .....	987-1120
May .....	433-552	November .....	1121-1252
June .....	553-674	December .....	1253-1352

**S. M. S. Medical College, Jaipur.**  
**LIBRARY,**

Acc. No...25034...

Cl. No.... ..

Date of Acc...2-9-60...

*h*

AMERICAN PUBLIC HEALTH ASSOCIATION

1790 BROADWAY

NEW YORK 19, N. Y.





# American Journal of Public Health and THE NATION'S HEALTH

---

Volume 35

July, 1945

Number 7

## Rôle of $\beta$ -Hemolytic Streptococci in Common Respiratory Disease\*

*Commission on Acute Respiratory Diseases,† Fort Bragg, North Carolina*

DURING the past 2 years, studies dealing with the etiology of common respiratory diseases in the Army have been carried out by the Commission on Acute Respiratory Diseases. One aspect of this work has been an attempt to evaluate the rôle of  $\beta$ -hemolytic streptococci by clinical, cultural and serological methods.

In a previous investigation, a group of patients were selected for study because they presented one or more of the usual clinical criteria considered indicative of a "streptococcal sore throat" (acute tonsillitis).<sup>1</sup> Bacteriological confirmation by repeated throat cultures was not obtained, however, in many of these cases.

In a second investigation of this problem the patients were again selected on a clinical basis, but the only cri-

terion employed for inclusion in the study was the presence of pharyngeal or tonsillar exudate.<sup>2</sup> Only one-half of these patients harbored  $\beta$ -hemolytic streptococci in their throats and only a quarter of the total number developed a significant increase in antibodies (antistreptolysin "O").

These results appeared to indicate that the clinical diagnosis of respiratory disease due to  $\beta$ -hemolytic streptococci might require not only bacteriological verification, but also—and perhaps more important—immunological confirmation. Support for this concept was obtained by the demonstration that cases of exudative pharyngitis which developed antistreptolysins differed in their clinical characteristics from those cases which failed to show an immunological response.

The present study was therefore designed to extend these observations to include all patients hospitalized for respiratory disease, as well as a sample of well soldiers of the population from which the patients came. Reëvaluation of the criteria for diagnosis was considered to be a necessary preliminary to the determination of the rôle of  $\beta$ -hemolytic streptococci in common respiratory disease.

\* Presented by Elias Strauss, Captain, M.C., at a Joint Session of the Health Officers, Laboratory, and Epidemiology Sections of the American Public Health Association, at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

† Members and associates of the Commission on Acute Respiratory Diseases are: John H. Dingle, Major, MC, AUS, Director; Theodore J. Abernethy, Major, MC, AUS; George F. Badger, Captain, MC, AUS; Joseph W. Beard, M.D.; Norman L. Cressy, Major, MC, AUS; A. E. Feller, M.D.; Irving Gordon, M.D.; Alexander D. Langmuir, Captain, MC, AUS; Charles H. Rammelkamp, Jr., M.D.; Elias Strauss, Captain, MC, AUS; and Hugh Tatlock, 1st Lieutenant, MC, AUS.

## METHODS

A military organization of approximately 12,000 men was selected for study. About 90 per cent of the men were recruits with less than 4 months of Army experience. During a 10 week period, from March 13 to May 19, 1944, all soldiers admitted to the hospital from this organization and found to have respiratory disease of any type, were studied. On admission to the hospital, a throat culture was taken and each man was examined for the presence of exudate on the pharynx or tonsils. Complete physical examinations were made and two additional throat cultures, on successive days, were taken on: (a) all patients with  $\beta$ -hemolytic streptococci in the first culture; (b) all patients with pharyngeal or tonsillar exudate; and (c) every fifth consecutive patient exhibiting neither pharyngeal exudate nor  $\beta$ -hemolytic streptococci on the first culture. Blood specimens on patients in the above three categories were obtained on admission to the hospital and again 3 and 6 weeks after the illness.

At fortnightly intervals during the study, throat cultures were obtained from well soldiers of three or four units in the organization, each unit consisting of approximately 250 soldiers. The men were assembled before morning mess and cultures obtained from alternate men in the line. Different units were cultured at each period. Approximately equal numbers of units with high and low incidence of respiratory disease were cultured. The selection of units for culturing was not based on knowledge of the prevalence or types of  $\beta$ -hemolytic streptococci in patients hospitalized from those units. Altogether throat cultures were obtained from each of 1,568 well soldiers—approximately 1 out of 7 in the entire organization.

Serological grouping of  $\beta$ -hemolytic streptococci was carried out by the

capillary tube precipitin technic, using commercial sera and bacterial extracts prepared by Fuller's method.<sup>3</sup> Typing of Group A strains was done by the capillary tube precipitin method using bacterial extracts prepared by Lancefield's method.<sup>4</sup> Typing sera were available for 30 of the more usual types.\*

Antistreptolysin "O" determinations were carried out by a modification of the method of Hodge and Swift.<sup>5</sup> The criterion for a significant rise in titer was stated in a previous publication.<sup>2</sup> Antistreptolysin was the only streptococcal antibody utilized in the study.

## RESULTS

During the 10 week period, 857 patients with respiratory disease were admitted to the hospital from the study group. Approximately 90 per cent of these patients had acute febrile respiratory infections of short duration, the great majority of which were of undifferentiated types. Included also in this group were cases which were considered clinically as "streptococcal sore throat." Only 10 per cent of all the patients had either lobar pneumonia, primary atypical pneumonia, or acute exanthemata. One case of scarlet fever was detected during the period of observation. The streptococcal infections diagnosed in this study occurred sporadically and without evidence of epidemic concentration.

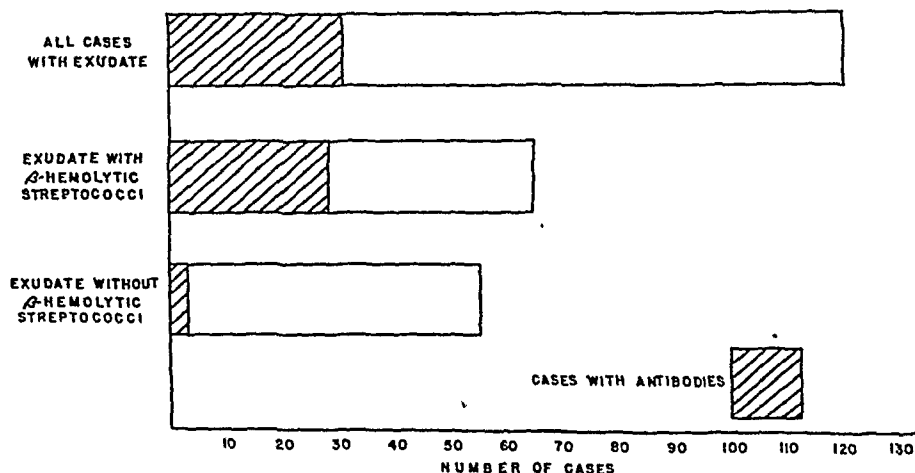
The results of clinical, bacteriological, and serological studies were analyzed in an attempt to establish criteria for the diagnosis of  $\beta$ -hemolytic streptococcal disease.

Pharyngeal or tonsillar exudate was selected as a clinical criterion since it

---

\* Typing sera were available for types 1, 2, 3, 4, 5, 6, 9, 12, 13, 14, 15, 17, 18, 19, 23, 26, 28, 29, 30, 31, 32, 33, 36, 37, 39, 41, 43, 44, 45, and 46. We are grateful to Drs Homer F. Swift and Rebecca C. Lancefield for generous supplies of typing sera, capillary tubes, and serum containers.

FIGURE 1

DISTRIBUTION OF CASES WITH EXUDATE BY PRESENCE OF  $\beta$ -HEMOLYTIC STREPTOCOCCI AND DEVELOPMENT OF ANTIBODIES

is a relatively objective finding which is commonly regarded as a characteristic feature of streptococcal infection of the throat. Exudate was found in the throats of 120 patients at the time of admission to the hospital (Figure 1). Half of these patients harbored  $\beta$ -hemolytic streptococci and half did not. Only one-fourth of all patients with exudate developed streptococcal antibodies. Almost all patients with exudate who developed antibodies also harbored  $\beta$ -hemolytic streptococci. One-half of the patients with both exudate and streptococci showed a diagnostic rise in serum antibodies. These findings paralleled closely the results obtained by the Commission in a similar study conducted the previous year.<sup>2</sup>

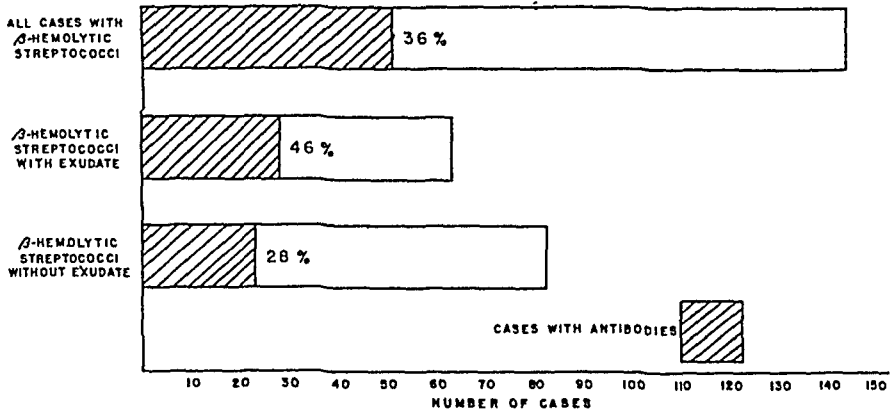
It was apparent that pharyngeal exudate alone was not indicative of a streptococcal illness since only one-quarter of such patients developed antibodies. With the view that clinical diagnosis might be more successful if other clinical criteria of "streptococcal sore throat" were employed, all cases were diagnosed clinically, on admission, on the basis of fever, edema of the

pharynx, diffuse injection of the mucous membranes, and cervical lymphadenopathy as well as exudate. With these criteria only 44 cases were diagnosed as "streptococcal sore throat." A fourth of these cases, however, did not have  $\beta$ -hemolytic streptococci on cultures and more than half did not develop antibodies. Moreover 106 other patients—all of whom had  $\beta$ -hemolytic streptococci by culture, and a quarter of whom had antibodies—were thought to have non-streptococcal disease by clinical criteria. A number of patients whose throats did not present the appearance believed characteristic of streptococcal infection actually harbored these organisms and developed antibodies. A smaller number of patients who appeared clinically to have streptococcal disease had neither streptococci nor antibodies.

Just as clinical criteria, alone, were found inadequate to diagnose streptococcal infections, so also bacteriological diagnosis, alone, was insufficient. A combination of clinical and cultural findings was more satisfactory. One hundred and forty-three patients, or 17

FIGURE 2

DISTRIBUTION OF CASES WITH  $\beta$ -HEMOLYTIC STREPTOCOCCI  
BY PRESENCE OF EXUDATE AND DEVELOPMENT OF ANTIBODIES



per cent of all hospital patients, harbored  $\beta$ -hemolytic streptococci,\* but only a third of them developed antibodies (Figure 2). Furthermore, in the absence of pharyngeal exudate only a quarter of cases with streptococci developed antistreptolysin. On the contrary, this antibody appeared in nearly

half of cases with both pharyngeal exudate and streptococci.

Human illnesses with  $\beta$ -hemolytic streptococci are most frequently due to Group A strains. In the present study, approximately two-thirds of all patients with  $\beta$ -hemolytic streptococci harbored Group A strains (Figure 3). This figure shows that 90 per cent of patients who developed streptococcal antibodies harbored Group A strains.

\* Based on the presence of  $\beta$ -hemolytic streptococci in any of three cultures.

FIGURE 3

DISTRIBUTION OF CASES WITH  $\beta$ -HEMOLYTIC STREPTOCOCCI  
BY GROUPS AND BY DEVELOPMENT OF ANTIBODIES

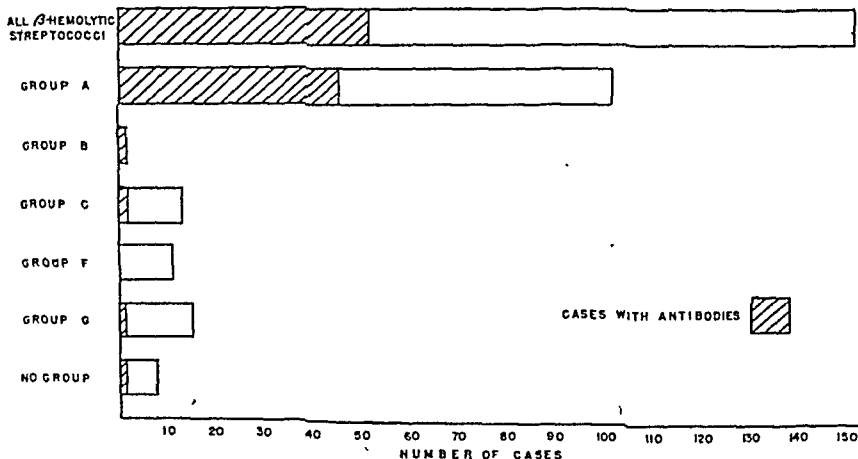
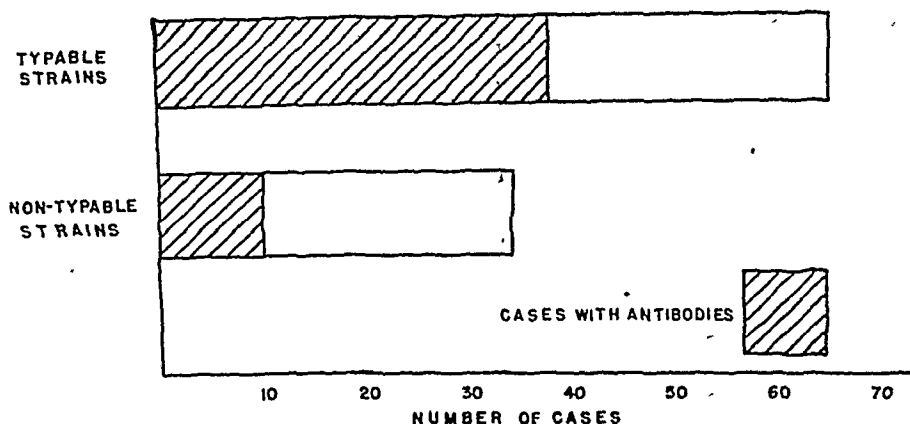


FIGURE 4

DEVELOPMENT OF ANTIBODIES IN CASES  
WITH TYPABLE AND NON-TYPABLE GROUP A  
 $\beta$ -HEMOLYTIC STREPTOCOCCI



Although a third of the streptococci isolated in the hospital patients were not Group A, only one-tenth of the cases with antistreptolysin were associated with these non-Group A strains. For practical purposes, therefore, streptococcal disease is chiefly a function of Group A.

Approximately 40 different serological types of Group A streptococci can be identified. As were mentioned previously, sera were available in this laboratory for the identification of 30 of the more common types. Type 19 was encountered most frequently and next, in descending order of frequency, types 3, 1, 6, 9, and 12. Nine other types were represented by only one or two cases each.

It was of interest to determine whether the presence of a typable strain was more likely to be associated with development of streptococcal antibodies than a non-typable strain. Figure 4 shows that 60 per cent of the cases with typable Group A strains developed antistreptolysin in contrast to 30 per cent of the cases with non-typable strains. The property of Group A strains which made them sero-

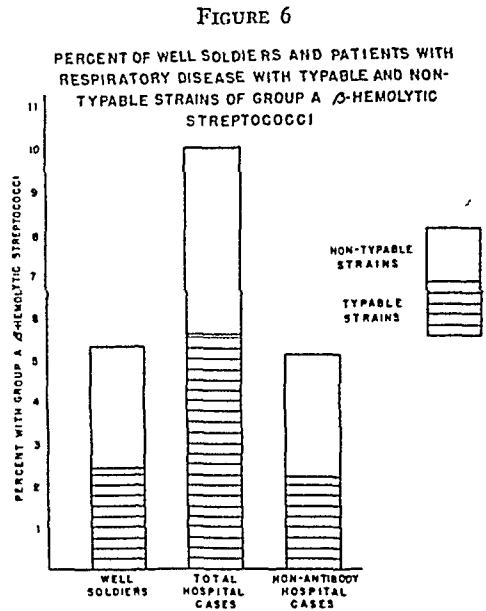
logically type-specific appeared also to be associated with the ability of such strains to produce antistreptolysins, as is indicated by the fact that 75 per cent of patients who had both exudate in the pharynx and typable Group A strains of streptococci developed antibodies.

The above results suggested that  $\beta$ -hemolytic streptococci played little or no rôle in the clinical illness of those hospital patients who did not develop antibodies. A comparison was therefore made of the prevalence and distribution of  $\beta$ -hemolytic streptococci among well soldiers and hospital patients. Eight per cent of well soldiers and 13 per cent\* of patients with respiratory disease harbored  $\beta$ -hemolytic streptococci (Figure 5). The difference in frequency between these two groups was accounted for almost entirely by the greater frequency of Group A strains in hospital patients. The right-hand column of Figure 5 indicates the frequency of  $\beta$ -hemolytic streptococci in hospital patients who

\* Based on the first culture, for purposes of comparison with well soldiers.

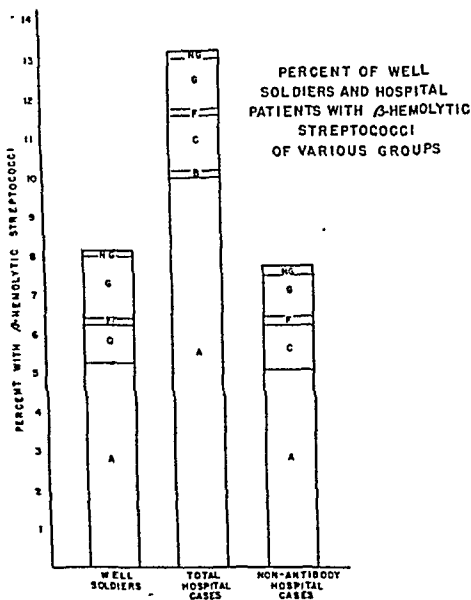
did not develop antistreptolysins. In these patients the total frequency and distribution of strains by serological groups was almost identical with the findings obtained in well soldiers. It may also be noted that the difference in height of the middle and right-hand columns represented the total number of hospital cases with antistreptolysins. Approximately 6 per cent of all patients with respiratory disease developed streptococcal antibodies.

In Figure 6 is presented a similar comparison of well soldiers and hospitalized patients based on the presence of typable and non-typable Group A strains of  $\beta$ -hemolytic streptococci. Five per cent of well soldiers and 10 per cent of patients with respiratory disease had Group A strains. As in the previous figure, the frequency of Group A streptococci in patients who did not develop antibodies was almost identical with the frequency of carriers of Group A in well soldiers. The percentage of typable and non-typable strains closely paralleled the total fre-



quency of all Group A strains. This similarity in frequency and distribution of  $\beta$ -hemolytic streptococci in well soldiers and in patients who did not develop antibodies is further confirmation of the conclusion that patients who did not have streptococcal antibodies did not have streptococcal disease.

FIGURE 5



## DISCUSSION

The diagnosis of streptococcal disease rests on a combination of clinical, bacteriological, and immunological evidence. In this study, as well as in previous investigations, a clinical diagnosis alone was found to be inadequate. Only half of all cases with pharyngeal exudate had  $\beta$ -hemolytic streptococci and only a quarter of all cases with exudate had streptococcal antibodies. When the diagnosis was limited to patients with other "characteristic" clinical features, such as edema and injection of the mucous membranes, as well as exudate, it was more reliable. However, a number of cases which did not have streptococci by culture were erroneously considered "streptococcal sore throat" and some cases which had both streptococci by culture and serum

antibodies were not recognized clinically as streptococcal illnesses.

Bacteriological diagnosis was also inadequate since only a third of all cases with  $\beta$ -hemolytic streptococci had antibodies. Respiratory illnesses associated with the development of antistreptolysin were most likely to be associated with both pharyngeal exudate and Group A strains of streptococci of specific types.

Throughout this presentation major emphasis has been placed on the importance, in diagnosis, of immunological findings—specifically the detection of a rise in titer of antistreptolysin "O." The evidence for the diagnostic value of this test is substantial. Antistreptolysin has been demonstrated in more than 80 per cent of cases of scarlet fever<sup>6</sup> and in 72 per cent of cases of an epidemic of septic sore throat.<sup>7</sup> In a food-borne epidemic of septic sore throat due to Type 5 streptococci, studied by the Commission, antistreptolysins developed in 85 per cent of all hospitalized patients.<sup>8</sup> Other observations by the Commission have indicated that a rise in titer of antistreptolysin was most uncommon in the absence of clinical and cultural evidence of streptococcal illness. Well soldiers studied culturally and serologically rarely showed a rise in antibodies. In the present study of 180 patients with respiratory disease without  $\beta$ -hemolytic streptococci, only 9 had a rise in titer of antistreptolysin and at least 3 of these patients, on the basis of later bacteriological studies, were known to have developed hospital cross-infections with  $\beta$ -hemolytic streptococci. The evidence indicates, therefore, that this antibody is specific for  $\beta$ -hemolytic streptococcal infections. In all probability, at least 75 per cent of respiratory illnesses caused by Group A  $\beta$ -hemolytic streptococci are associated with a rise in antistreptolysin.

What, then, can be said of the rôle of streptococci in those respiratory ill-

nesses in which streptococcal antibodies do not develop? It has been shown that the prevalence of streptococci which did not produce antibodies in hospital patients was almost identical with the prevalence of streptococci in well soldiers from the same population. The distribution of these organisms by serological groups and by typable and non-typable strains was also alike in well soldiers and hospital patients without antibodies. It seems justifiable to conclude, therefore, that the streptococci in both groups were merely carrier organisms and had no relationship to the respiratory illness which brought the patients to the hospital.

The present study was carried out in an area of low prevalence of  $\beta$ -hemolytic streptococci. During the period of observation no recognizable epidemics of streptococcal infection occurred. The experience at this post is not necessarily representative of the rôle of  $\beta$ -hemolytic streptococci in all geographic areas or in all military organizations. It is believed, however, that the criteria of illness due to  $\beta$ -hemolytic streptococci employed in this study are applicable also to epidemic conditions.

#### SUMMARY AND CONCLUSIONS

The diagnosis of streptococcal disease depends on the combination of clinical illness, bacteriological findings, and the development of specific antibodies. The presence of pharyngeal exudate alone was not a reliable guide to the presence of streptococcal illness since only half of such patients had streptococci by culture and only a fourth developed antibodies. Of all patients with respiratory disease who harbored  $\beta$ -hemolytic streptococci in their throats, only one-third had streptococcal infection; the other two-thirds were carriers of the organisms, and in these patients the streptococci present were of no etiological relationship to the respiratory disease. True strepto-



coccal disease occurred most frequently when pharyngeal exudate was present and typable Group A strains of  $\beta$ -hemolytic streptococci were found by culture.

In the military organization under study, which consisted chiefly of recruits, the prevalence of  $\beta$ -hemolytic streptococci among well soldiers was 8 per cent. The prevalence of Group A strains in the same population was 5 per cent. Cultural and serological results indicated that among all soldiers hospitalized for respiratory disease, only 6 per cent had immunological evidence of streptococcal infection, although more than twice this number harbored  $\beta$ -hemolytic streptococci in their throats.

#### REFERENCES

1. Dingle, J. H., Abernethy, T. J., Badger, G. F., Buddingh, G. J., Feller, A. E., Langmuir, A. D., Rueggsegger, J. M., and Wood, W. B. Primary Atypical Pneumonia, Etiology Unknown. *Am. J. Hyg.*, 39:67-128, 197-268, 269-336, 1944.
2. Commission on Acute Respiratory Diseases. Endemic Exudative Pharyngitis and Tonsillitis. Etiology and Clinical Characteristics. *J.A.M.A.*, 125:1163-1169, 1944.
3. Fuller, A. T. The Formamide Method for the Extraction of Polysaccharides from Haemolytic Streptococci. *Brit. J. Exper. Path.*, 19:130-139, 1938.
4. Swift, H. F., Wilson, A. T., and Lancefield, R. C. Typing Group A Hemolytic Streptococci by M Precipitin Reactions in Capillary Pipettes. *J. Exper. Med.*, 78:127-133, 1943.
5. Hodge, B. E., and Swift, H. F. *J. Exper. Med.*, 58:277, 1933.
6. Mote, J. R., and Jones, T. D. Studies of Hemolytic Streptococcal Antibodies in Control Groups, Rheumatic Fever, and Rheumatoid Arthritis. II. The Frequency of Antistreptolysin "O," Antifibrinolytic, and Precipitating-Antibody Responses in Scarlet Fever, Hemolytic Streptococcal Infections, and Rheumatic Fever. *J. Immunol.*, 41:61-85, 1941.
7. Rantz, L. A. Group A Hemolytic Streptococcus Antibodies III. A Study of the Simultaneous Infec-

tion of a Large Number of Men by a Single Type. *Arch. Int. Med.*, 73:238-240, 1944.

8. Commission on Acute Respiratory Diseases. Unpublished Observations.

#### ACKNOWLEDGMENT

The Commission on Acute Respiratory Diseases takes pleasure in acknowledging the assistance of the technical staff of the laboratory: Pfc. Alexander Adler, T/5 David O. Foltz, Corp. Melvin H. Kaplan, T/5 Gerald J. Leuty, Barbara A. Mulliken, Dorothy C. Mickle, Walter A. Mickle, 2nd Lieutenant, Sn.C., A.U.S., Thomas J. Oliver, 1st Lieutenant, Sn.C., A.U.S., Ralph L. Robinson, 1st Lieutenant, Sn.C., A.U.S., and Irene A. Salmandra.

The Commission wishes to thank the following officers and their staffs at Fort Bragg for assistance in making this study possible: Major General D. C. Cubbison, Commanding General, Field Artillery Replacement Training Center; Brigadier General H. C. Coburn, Jr., M.C., Surgeon, Fort Bragg; Colonel G. D. Chunn, M.C., Commanding Officer, Regional Hospital; Lieutenant Colonel W. B. Daniels, M.C., Chief of Medical Service; Lieutenant Colonel H. O. Brown, M.C., Chief of Laboratory Service; Major R. L. Siegel, M.C., Surgeon, Field Artillery Replacement Training Center; Captain Samuel Cohen, M.C.; and 1st Lieutenant Morris A. Wessel, M.C.

NOTE: This investigation was supported through the Commission on Acute Respiratory Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, United States Army, and by grants from the Commonwealth Fund, the W. K. Kellogg Foundation, the John and Mary R. Markle Foundation, and the International Health Division of the Rockefeller Foundation to the Board for the Investigation and Control of Influenza and Other Epidemic Diseases for the Commission on Acute Respiratory Diseases.

# The Bacteria "Count"—An Estimate Capable of Accurate Interpretation\*

JAMES D. BREW, PH.D., AND ROBERT S. BREED, PH.D.,  
F.A.P.H.A.

*University of Tennessee, Knoxville, Tenn., and New York State Experiment  
Station, Geneva, N. Y.*

ABOUT every decade someone challenges the accuracy of the bacteria "count" in general, or the accuracy of one method of making determinations of the number of bacteria as compared to another method. An inquiry into the arguments presented invariably reveals the challenger to be either unfamiliar with the results of statistical studies made during the past thirty years, and/or prejudiced in favor of a particular laboratory method—usually that method which serves best under his own special conditions or training.

The interest of the authors in the methods by which bacteria counts were made, and in their interpretation, began independently during the first decade of this century. Since 1913 we have worked as associates in the same department, or coöperatively in different but related fields. During this period we have experienced almost every conceivable reaction, it would seem, to the merits and demerits of the various laboratory procedures devised to facilitate administrative efforts to control the quality of milk supplies.

Viewing these associations and experiences of more than three decades in retrospect, we are reminded of the sev-

eral series of statistical studies made by different bacteriologists on the accuracy of bacterial count in general, beginning with one of the first studies ever made. This was supervised by Conn and reported in *Public Health Reports*.<sup>1</sup> The results of these and other similar studies have led to constructive changes in *Standard Methods for the Examination of Dairy Products*.

Just how much has actually been accomplished toward increased accuracy by our efforts to secure greater uniformity in laboratory methods has never been determined statistically. Those who have been close to the realities are inclined to feel that it is entirely within the realm of possibility that variabilities in duplicate counts, as made in different laboratories, are about as great in 1944 as they were in 1910 before there were any official standard methods. This statement is not intended as a criticism. Instead, it is made in the hope of focusing greater attention upon the fact that estimates of the numbers of bacteria or of bacterial colonies in milk, or in similar products, constitute a valuable index of the efficiency of certain procedures, even though these estimates may always be highly variable.

\* Presented before the Laboratory Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

BACTERIAL CONTROL A HALF  
CENTURY AGO

Over fifty years ago Sedgwick and

Batchelder reported that the bacterial content of the milk offered for sale in Boston was greater than when produced on the farm. This appears to have been the first report published in America on the number of bacteria present in a market milk supply.<sup>2</sup> The fact that these pioneers of over a half century ago used the term "estimation" in their title, suggests that they had no illusions regarding the true limitations of the agar plating procedure that they used. In the hands of many zealous individuals, however, the laboratory method by which "estimates" were first made, soon became accepted everywhere as the method by which bacteria "counts" were made. To count, irrefutably connotes greater accuracy than to estimate. Thus an innocent shift of terminology started a headlong race in the direction of a misapplication of the principle of making and applying bacterial estimates.

In 1893 came a second step which definitely implied extreme accuracy in numerical determinations of bacteria, namely the first attempt to develop a very low count milk, which became known to the public as certified milk. This movement initiated by Dr. Coit at Montclair, N. J., involved the use of laboratory methods for controlling the number of bacteria in milk. The first standards fixed were less than 20,000 per ml., but were soon dropped to 10,000. In the years that followed, individual producers and laboratory workers naturally yielded to the temptation to interpret such counts in terms of procedures in the dairy; whatever correlation there may be, however, is now recognized as being relatively insignificant.

This early effort to secure a low count in medically supervised raw milk was soon followed by efforts to fix bacterial limits for market milk supplies. The New York City Board of Health established a 1,000,000 count limit in

1900. The Boston City Board of Health made legal a 500,000 count limit in 1905. In 1908, New York City in a revised code established limits that were not only markedly lower but went so far as to imply sufficient accuracy and exactness in the making of counts to justify defining four grades of milk, the principal difference being the following bacteria count standards:

	<i>Winter</i>	<i>Summer</i>
1 Selected	50,000	100,000
2 Inspected	50,000	100,000
3 Guaranteed	30,000	30,000
4 Certified	10,000	10,000

These differences—initiated in official circles and having the force of law—we now know fall within the range of experimental error.

The downward trend in bacteria count limits finally assumed the proportions of an avalanche approaching the ridiculous. During the first decade of the 20th century, the Bureau of Animal Industry of the U.-S. Department of Agriculture devised a score card by which it was thought the quality of milk could be expressed mathematically. A "perfect" milk scored 100 per cent, distributed arbitrarily as follows: bacteria count 35, flavor and odor 25, visible dirt 10, fat 10, solids—not fat—10, titratable acidity 5, bottle and cap 5. A sample having an average bacteria count of 401 scored 0.5 per cent lower than one having 400 bacteria per ml.

Having in mind the realities involved in an honest interpretation of bacteria counts in establishing numerical limits, four principles should be kept in mind: (1) there is a limit below which production and distribution costs become excessive; (2) there is no significant relationship between the number of bacteria in milk and the factor of safety; (3) in general, the number of miscellaneous saprophytic organisms in milk has to be well up into the millions

per milliliter before there is any detectable influence upon the flavor; (4) the rank and file of consumers have never been greatly interested in the bacterial count of milk as such, but they are interested primarily in its food value, its palatability, the length of time the milk will keep, and in its safety.

#### BACTERIA COUNT LIMITS AND LOGARITHMIC REPRODUCTION

In fixing bacterial count limits, a most fundamental principle relative to the method of reproduction of bacteria seems to have been overlooked. This oversight has, in part at least, led those who formulate milk ordinances astray. One of the first things a student learns in the study of bacteriology is that bacteria reproduce by simple cell division—binary fission—roughly, about every 30 minutes. This means that they divide geometrically (1, 2, 4, 8, 16, 32, etc.) and not lineally, (1, 2, 3, 4, 5, 6, etc.). The difference at the end of 15 hours in the ultimate results of reproduction every half hour, starting with a single bacterial cell, will be better appreciated after studying the following table:

<i>The Number Every 5 Hours by Lineal Reproduction</i>	<i>The Number Every 5 Hours by Geo- metric Reproduction</i>
1	1
10	1,024
20	1,048,576
30	1,073,753,824

In any interpretation placed on the number of bacteria that may be expected in milk or any other substance, or in any attempt to fix numerical limits, the theoretical rate and numbers indicated in Column 2 should be the guide.

#### EXPERIMENTAL ERROR IN DUPLICATE DETERMINATIONS

A combination of factors is responsible for the normally high experimental error in duplicate bacteria counts. This may be large even when

two plates are prepared from the same dilution bottle by the same person. The error becomes greater (1) as the counts are made from dilutions prepared independently from separate samples, (2) as the counts are made by different individuals from duplicate samples, and (3) as the counts are made from duplicate samples by different individuals working in different laboratories.\* In practice, these experimental errors normally range as high as 100 per cent to several hundred per cent, and occasionally several thousand per cent. Hence, *the importance of making a series of counts* before any interpretation is attempted becomes clear.

#### IMPORTANCE OF KNOWING TYPES OF BACTERIA PRESENT

This factor cannot be stressed too strongly. It is one of the most important elements in an accurate appraisal of any bacterial situation—more important than the "count" alone, in fact.

In *Standard Methods* it is pointed out that a laboratory should carry out controls whenever there is reason to suspect the presence of bacteria that do not develop on agar plates. Yet, as Dr. Black has shown in his report,<sup>3</sup> this requirement is almost universally ignored. Much energy is being spent in determining whether certain harmless thermophilic bacteria in a given raw milk will be killed during pasteurization. Very few persons, however, examine pasteurized milk to determine whether thermophilic bacteria are present, and practically everyone ignores the possibility of the growth of low temperature bacteria in cream held in cold storage for a few days.

Just why certain harmless saprophytic

\* See, for example, a notable study made by the New York State Department of Health under the direction of W. D. Tiedeman (22nd Annual Report of the International Association of Dairy and Milk Inspectors, 1934, pp. 225-236).

bacteria, which will grow at 37° C., are held to be so significant, while other saprophytic bacteria which grow readily at higher and at lower temperatures should be ignored, is hard to understand. The presence of these high and low temperature bacteria is just as indicative of faulty handling as is the presence of thermophilic bacteria.

The great advantage of the microscope soon becomes evident when a control over these high and low temperature bacteria is established. With the microscope it is possible to determine the types of bacteria present in either raw or pasteurized milk. Likewise it is possible quickly to detect milk excessively high in leucocytes. A person with the proper background can interpret findings with a high degree of accuracy within an hour's time, and in a way that is much more satisfactory than examinations that are limited to a counting of colonies of bacteria that happen to be adapted to growth on agar plates incubated 2 days at 37° C.

#### COMPARISONS OF THE ACCURACY OF PLATE AND DIRECT MICROSCOPIC COUNTS

It would be a waste of time to develop a detailed discussion of the comparative accuracy of "counts" made by the plate and microscopic methods. As has been explained many times in the literature, the true mathematical accuracy of the counts obtained by the two methods can never be determined until someone devises a method by which the actual number of bacteria in a given volume of milk can be counted. Only in this way can we obtain a figure for comparison with the figures obtained by estimating numbers.

The counts obtained by the two methods are not exactly comparable. The plate count represents the groups of bacteria that grow on a given agar at a given temperature as they exist in the dilution water rather than as they

exist in the milk sample. Too frequently the plate count is reported, and even more frequently treated, as if it were a count of individual bacteria.

This matter can be made clearer by a simple comparison with a count of objects that are larger than bacteria. In the case of the agar plate count, it is as if a count were made of the number of flocks of sheep and goats in each of the states of the Union and then the results obtained regarded as a count of the number of individual sheep. As a matter of fact, the number of flocks would bear no constant relationship to the total number of sheep, as the size of flocks in such states as New Hampshire and Vermont would be much smaller than the size of the flocks in Wyoming and Utah. Likewise, forgetting the goats that are almost as numerous as the sheep in some states is in line with the actions of those who forget the high and low temperature as they incubate plates at a single temperature (32 or 37° C.).

The recognition of the fact that plate counts and microscopic counts are very different in nature does not prevent the satisfactory use of either count, provided the size of possible errors is kept in mind. Some studies have been made in an effort to show the number of bacteria present in each clump under average conditions. Robertson<sup>4</sup> showed that the *most frequent ratio* between the agar plate count incubated at 37° C. for 2 days, and the microscopic count of individuals in the samples of milk that he examined was 1:4. This *ratio* was lowered to 1:2.5 when the plates were incubated at 21° for 5 days, and was lowered to 1:2 when incubated at 21° for 5 days with 2 additional days at 37° C. Unfortunately, these most frequent ratios did not occur in more than 15 to 20 per cent of the samples, and the observed individual ratios pointedly illustrate the fact that it is unwise to attempt to interpret the

agar plate count in terms of a direct microscopic count of individual bacteria.

#### CONCLUSIONS

It is wise to use agar plate and microscopic estimates conservatively in view of the known more or less uncontrollable variabilities. We should not be deceived when results secured by either method are reported in exact figures. These estimates may be used safely in judging whether a milk is in "acceptable," "satisfactory," or "unsatisfactory," condition. But when we attempt to draw fine distinctions as though reflecting actual differences in quality, we are making a use of these methods of estimating numbers that is

not conservative and is not justified.

Wherever the agar plate method is used, it should be remembered that many of the high and low temperature organisms that occur so frequently in pasteurized milk and cream may not grow at 37° C., and that some fastidious organisms will not grow well on even the new standard agar. While some dead bacteria may appear in stainable condition in making microscopic estimates, it should be remembered that dead bacteria are just as significant as the living in interpreting the past history of a given sample of milk. No high quality market milk or cream contains an excessive number of bacteria, either living or dead.

#### *Discussion—Robert S. Breed, Ph.D.*

Dr. Brew and I greatly enjoyed preparing this joint paper. It has a certain historical significance as it was at the Richmond, Virginia, meeting of the American Public Health Association, thirty-five years ago, that I had the pleasure of presenting a paper describing a new and direct method of counting leucocytes in milk. This method had been developed the previous summer while I was working with Professor S. C. Prescott in his Biochemical Laboratory on Boylston Street in Boston.<sup>5</sup> Later I found that the same technic could be used for counting bacteria in milk and reported this fact in 1911.<sup>6</sup>

When Dr. Brew and I became associated at the Geneva Experiment Station in 1913, I found that Dr. Brew had already completed making an extensive series of comparative counts of bacteria in milk, using both the agar plate and the direct microscope technics. This report was published by Dr. Brew thirty years ago.<sup>7</sup>

The pioneer work of two other individuals should be mentioned in this connection. Mr. N. E. Lazarus, now of

Buffalo, New York, became interested in the direct microscopic technic very soon after it was first developed. He was bacteriologist at the time for the Mutual-McDermott Milk Company of New York City. In the fall of 1915, the New York City Department of Health used the policy of degrading A milk plants to a grade B status when bacterial counts became excessive. When his company met this difficulty at a plant in northern New York with about 350 producers, Mr. Lazarus was sent to the plant to see what could be done toward correcting the high bacterial counts obtained from this plant. He reported back the next day that he was sending milk to the city that would meet the standards required for bacterial count. Three days later he received a long-distance telephone call from his manager that the Board of Health was looking for preservatives in the milk as they did not believe anyone could correct the quality of such a supply in so short a time. Mr. Lazarus then invited the Health Department group to come to the plant and see for themselves what he had done. This

group arrived the next morning. To paraphrase a famous saying: They came, they saw, and were satisfied. From that time on, the New York City official group has believed in the value of this technic. Dr. W. H. Park, with Dr. H. W. Conn and others, approved the recognition of the microscopic technic as a standard method of the American Public Health Association in 1915 before I became a member of the Standard Methods Committee for Milk Analysis in 1916. This technic has been used in various ways in the milk control program of New York City, and today holds a firm place for use in checking the quality of raw milk supplies, both by the industry and by the city inspection service.

At about the same time (1916) Professor J. M. Frayer, now of the Vermont Agricultural Experiment Station staff, was bacteriologist for the Lyndonville Creamery Association of Vermont. During this year the Bureau of Chemistry of the U. S. Department of Agriculture undertook to enforce the provisions of the Federal Food and Drug Act governing the quality of milk imported from Canada. When Prof. Frayer, who had been taught the direct microscopic technic by Dr. G. C. Supplee at Cornell the previous year, asked permission for his company to ship milk across the border the day after he arrived at a Canadian plant, the federal authorities objected on the ground that he could not be sure of the quality of the milk. However, they agreed to a trial shipment, further shipments to be held until they could count their agar plates 48 hours later. When they found Prof. Frayer had made a proper selection of the good quality milk, they allowed further shipments when quality was checked before shipment by microscopic examinations.

The federal group soon after became interested in the microscopic technic and attempted to use it to examine

pasteurized milk to determine the number of bacteria present in the milk *before pasteurization* on the theory that the bacteria killed during pasteurization would remain in stainable condition. When this was found *not* to be true, the matter of using the microscope for a control of the bacterial quality of pasteurized milk was dropped. However, the years have accumulated evidence that the bacteria found in stainable condition in pasteurized milk are generally living (though frequently incapable of growing on standard agar incubated at 37° C.), and the microscope is now finding its place in control of the quality of pasteurized as well as raw milk.

Even though the use of the microscope for estimating numbers of bacteria is an older procedure (Leeuwenhoek so used it in 1683) than the agar plate technic, it will be many years before those who have used the later technic for judging milk quality fully realize that there is no significant difference in the quality of two bottles of pasteurized milk, one of which gives a standard plate count of 6,000, and the other a standard plate count of 26,000. Yet such is the case.

#### REFERENCES

1. Conn, H. W. Standards for Determining the Purity of Milk; *Pub. Health Rep.*, 30:2349-2395, 1915.
2. Sedgwick, W. T., and Batchelder, J. L., Jr. A Bacteriological Examination of the Boston Milk Supply. *Boston M. & S. J.*, 126:25, 1892.
3. Black, Luther A. Surveys of Milk Laboratories in War Areas in the U. S. *Pub. Health Rep.*, 58, 44: 1605-1623 (Oct. 29); 45:1641-1658 (Nov. 5); and 46:1681-1689 (Nov. 12), 1943.
4. Robertson, A. H. The Relation Between Bacterial Counts from Milk as Obtained by Microscopic and Plate Methods. *Tech. Bull. 86. N. Y. State Exper. Sta.*, Sept., 1921.
5. Prescott, S. C., and Breed, R. S. The Determination of the Number of Body Cells in Milk by a Direct Method. *Am. J. Pub. Hyg.*, 20, 3:663 (Aug.), 1910.
6. Breed, R. S. The Determination of the Number of Bacteria in Milk by Direct Microscopical Examination. *Centralbl. f. Bakt. II. Abt.* 30:337-340, 1911.
7. Brew, James D. A Comparison of the Microscopical Method and the Plate Method of Counting Bacteria in Milk. *Bull. 373, N. Y. State Exper. Sta.*, Feb., 1914.

CHART 1

U. S. Department of Labor  
CHILDREN'S BUREAU  
Washington

Maternal and Child-Health Services  
Administered or Supervised by State  
Health Agency

Activities Series MCH-51  
(Revised 1939)

Social Security Act  
Title V, Part 1; Maternal and  
Child-Health Services

State of ..... Report for quarter ended ....., 19.. Date submitted.....  
(Month) (Day)

Signatures .....  
(Director, State division of maternal and child health) (Executive officer, State health agency)

Type of Service  (1)	Total (including MCH demonstrations)  (2)	MCH Demonstrations (Included in Col. 2)		
		(3)	(4)	(5)
INFANT HYGIENE				
Individuals admitted to medical service (E 1)...				
Individuals admitted to nursing service (E 2)....				
Visits to medical conferences (E 3).....				
Field and office nursing visits (E 5, 6). ....				
PRESCHOOL HYGIENE				
Individuals admitted to medical service (E 8)...				
Individuals admitted to nursing service (E 9) ..				
Visits to medical conferences (E 10).....				
Field and office nursing visits (E 12, 13). ....				
Inspections by dentists or dental hygienists (E 14)				
Attendance at infant and preschool classes (E 20)				

ical service” during a particular calendar year will actually be making the first visit in their lives and therefore really be “brand new.” Chart 2 illustrates schematically the maximum possibility of the period of clinic observation for 24 children. Each bar represents one child admitted at birth, and remaining in clinic during the entire first year of his life. The admission of one child each month of the calendar year implies of course, a stable clinic population and an even flow of admissions. The checked part of each bar represents the portion of the first year of the child’s life in the calendar year of his birth, when he is considered “brand new.” Conversely, the solid part of the bar represents that portion of the first year in the succeeding calendar year when he is classified as a “previous year” case.

Clearly there are just 12 children admitted to service for the first time in their lives in each year. On the other hand, between January 1 and December 31, 24 different infants received service and this is the number which would be reported on line E-1 of the form previously mentioned. Obviously, it is not in order to use this count of total admissions—total different individuals served—to compare with the potential case load as measured by the births which took place during that year. If all the infants in a community were admitted to service and all attended throughout their first year of life, the proportion of births admitted to clinic would, by this method, be 200 per cent. The correct ratio is that of “brand new” infants to registered births. Although this ratio is now in use in many places where a separate



# Indices and Standards for Child Health Services

MYRON E. WEGMAN, M.D., F.A.P.H.A., AND  
MARJORIE T. BELLOWS, F.A.P.H.A.

*Department of Health, New York, N. Y.*

CONTINUOUS supervision of health during the infant and preschool years is generally accepted as an essential factor in the promotion of optimal growth and development. Quantitative standards may be used as an index of the completeness of this supervision although they cannot, of course, measure the quality of service rendered which must be evaluated independently or coincidentally. It should be possible, however, based on knowledge of the processes of growth and development and of infant needs, to set up certain standards of service as guides for administrative planning and control of services.

In the most recent revision of the *Evaluation Schedule* of the American Public Health Association and the *Health Practice Indices*<sup>1</sup> derived from the reports submitted on this form, emphasis is placed, rightly, on measuring service in a community as a whole rather than limiting the record to that supplied by a particular agency. The present discussion, however, will be limited to the activities of an organized clinic and to the measurement of two specific, quantitative phases of those activities—the proportion of infants in the community cared for in the clinic and the amount of service given those infants.

Data bearing on these two points usually come from counts made at the end of each clinic session, summarized

over various periods, monthly, quarterly, and annually. Many different forms of summaries of health department activities are in use but the one probably best known is the *Tabulation of Health Department Services*,<sup>2</sup> approved by the State and Territorial Health Officers, U. S. Public Health Service, and the U. S. Children's Bureau. The part of this report dealing with infant and preschool services is shown in Chart 1. Only two lines refer directly to medical service to infants in clinics, lines E-1 and E-3. The report is limited to a calendar year and therefore line E-1 includes all the individual children who made at least one visit during the calendar year of the report. Thus, an infant who visits the clinic in December, 1942, for the first time is counted under E-1 as an "individual admitted" on the 1942 report and when he makes a revisit the following January he is counted as an "individual admitted" on the 1943 report. Certain limitations of this information must be recognized, especially in answering the first question under discussion, i.e., the proportion of the infants in the community cared for in the clinic. The maximum potential case load for a calendar year is presumed to be the reported births.

It is obvious that in many cases one child will be counted in two calendar years. It is possible that as few as half of the "individuals admitted to med-

# World War I and Tuberculosis

## A Statistical Summary and Review

GODIAS J. DROLET, F.A.P.H.A.†

*Statistician, New York Tuberculosis and Health Association, New York, N*

WORLD War I lasted nearly five years, from the middle of 1914 to November, 1918. The extent to which tuberculosis spread at that time involved countries ‡ all over the globe and will never be fully measured. Neutral nations as well as those at war suffered!

It is unnecessary to remind an audience of epidemiologists, health officers, and registrars that the machinery for the registration of deaths and their causes simply disappeared in areas where fighting was going on, especially at a time when even national governments were forced into exile. After all, in peacetime the current registration of cases of tuberculosis is required in but few countries in this world. However, there are at hand certain sample records which give an idea of the additional suffering caused by tuberculosis during World War I, especially during the five years of 1914 to 1918.

For the purpose I have assembled, I am afraid a bit inadequately but still significantly, such mortality figures as

could be found readily for 24 different countries and 34 large cities scattered over the globe. Onto the years 1914 to 1918, I have added for comparative purposes similar data for the pre-war year 1913 and the two post-war years of 1919 and 1920 (Tables 1 and 2).

Almost everywhere the tuberculosis death rate was highest in 1918 when influenza added its woes and hastened the deaths of many victims of tuberculosis as well as those of others. But for the purpose of ascertaining the progress of tuberculosis during the war years it is perhaps fairer to feature the rates of 1917 against those of 1913 and 1920 (Tables 3 and 4).

### IN AMERICA

In the United States, in 1913, our tuberculosis death rate in the light of nowadays was still high, 148 per 100,000 population. The effect of war conditions merely delayed the decline which had been going on for years. Still, the rate went up to 150 in 1918 and in the post-war year 1920 quickly fell to 114. Even then, the deaths in this country in 1917 alone were probably between 18,000 and 20,000 more than they otherwise would have been.

We must also recall that the mortality record from tuberculosis in any one year represents never more than 40 or 50 per cent of all who are attacked by the disease, and that other victims follow in subsequent years among those infected previously.<sup>1</sup>

\* Presented at a Joint Session of the Health Officers, Vital Statistics and Epidemiology Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

† Former statistician, Commission for the Prevention of Tuberculosis in France.

‡ In World War I, the Central Powers were Germany, Austria-Hungary, Bulgaria and Turkey; the principal Allied Nations were France, Italy, Russia, England and the United States; neutral countries, closely affected, included the Netherlands, Denmark, Norway and Sweden.

TABLE 1

## World War I and Tuberculosis

Annual Mortality\* from 1913 to 1920 in 24 Different Countries

	Population in/about 1920	Rate per Each 100,000 Inhabitants							
		1913	1914	1915	1916	1917	1918	1919	1920
States	106,543,031	148	147	146	142	147	150	126	114
	4,480,000	214	207	220	214	221	218	194	170
	4,882,497	169	162	164	160	159	160	131	124
nd, Wales	37,524,000	135	136	151	153	162	169	128	113
im	7,462,000	118	124	131	149	211	245	144	114
et	35,970,000	212	216	218	214	211	243	209	185
	36,250,000	143	144	158	166	175	209	173	160
	21,347,000	152	149	160	161	172	204	181	180
ia	7,100,000	177	174	180	194	200	204	186	151
iny	59,857,283	143	142	148	162	206	229	212	154
at	30,104,000	259	256	322	387	432	403	360	284
ry†	20,792,709	328	308	354	366	383	410	388	348
o-Slovakia	13,595,816	296	290	325	331	331	359	314	261
id†	3,364,000	261	259	269	276	261	258	216	219
Norway	2,649,000	221	221	210	232	212	201	190	190
Sweden	5,904,000	185	193	204	206	195	176	164	162
Denmark	3,218,000	126	131	125	138	158	128	114	113
Netherlands	6,965,700	142	140	144	167	182	203	174	147
Switzerland	3,880,000	202	195	190	191	207	201	200	180
Japan	55,963,053	208	211	213	221	223	248	236	224
Philippines	10,607,872	228	237	239	246	250	315	313	275
Australia	5,412,318	81	75	73	75	66	68	75	67
New Zealand	1,192,620	76	67	63	67	69	75	67	71
South Africa‡	1,519,488	51	45	44	46	50	46	45	46

\* All forms of tuberculosis. † Pulmonary tuberculosis. ° Civilian population. ‡ White population. § France, 77 non-invaded departments. Italy, 1917-1920, non-invaded communes. Austria, pre-war, 1913-1918; population, in 1911, 28,649,449; in 1920, 6,476,000. Hungary, pre-war, 1913-1918; population, in 1910, 20,792,709; in 1920, 8,054,000. Compiled from *Epidemiological Reports*, Health Section, League of Nations; *Annuaire Statistique*, France; *Official Yearbooks* of certain countries listed, etc.

NOTE: Because of the difficulty of estimating population in wartimes, tuberculosis death rates mentioned by some authorities differ for certain places—though this does not alter the number of deaths themselves. In cases where original sources of information were available they have been given preference. Thus, instead of quoting rates from the reports of the League of Nations, there has been utilized for Vienna those of its Bureau of Statistics; similarly for France and Paris, the figures of the *Annuaire Statistique de France*; for Hungary, the data received directly from the State Tuberculosis Commission.

We have some measure in the records of the Veterans Administration of the incidence of tuberculosis at that time, and its problem thereafter, among members of the armed forces during World War I. Only last spring, in Chicago, at the annual meeting of the National Tuberculosis Association, Colonel Welford,<sup>2</sup> Assistant Medical Director of the Veterans Administration, reported that "By June 30, 1922—less than four years after the armistice—compensation for 'service connected' tuberculosis had been granted to a total of 36,600 living veterans who had served in that conflict."

In 1928, ten years after the first World War, of 6,045 tuberculous

veterans in hospitals, 58 per cent were "service connected." And these figures relate only to the 4,750,000 men in military service during World War I and not to the 95,000,000 civilians.

Spillman<sup>3</sup> brought out recently that tuberculosis during World War I has cost for the veterans alone approximately \$960,000,000 to date in compensation, vocational training, insurance, and hospitalization.

In the United States Navy and Marine Corps, according to Smiley and Raskin,<sup>4</sup> the "original admission rate" to the sick list because of tuberculosis was 372 per 100,000 men in 1915, and rose to 476 in 1918.

In Canada, Miller<sup>5</sup> reports, in a study published in 1939, that of

TABLE 2  
World War I and Tuberculosis  
Annual Mortality\* from 1913 to 1920 in 34 Large Cities

City	Population in/about 1920	Rate per Each 100,000 Inhabitants							
		1913	1914	1915	1916	1917	1918	1919	1920
New York	5,683,765	199	200	196	182	188	184	152	126
Montreal	603,703	215	225	200	190	195	214	192	182
Rio-de-Janeiro	1,170,660	417	438	434	407	392	444	388	394
Sao Paulo	579,000	117	126	126	109	124	124	116	110
Sydney	955,900	82	69	62	65	55	59	75	71
Melbourne	816,800	110	109	94	104	101	101	104	98
Tokyo	2,437,503	427	409	395	397	381	430	417	352
Bombay	1,200,473	219	192	174	194	216	256	283	187
Belfast	393,000	300	282	262	269	305	319	281	243
Edinburgh	420,000	159	162	148	140	151	124	118	102
London	4,484,523	165	177	199	189	211	214	145	129
Lille	201,000	306	...	...	559	402	540	263	181
Paris	2,904,635	385	396	376	361	358	339	279	272
Madrid	751,352	301	314	327	320	337	390	384	392
Rome	691,314	224	228	241	259	281	392	301	238
Helsinki	197,848	315	263	288	300	245	263	208	204
Oslo	258,403	228	219	214	216	194	201	189	209
Stockholm	422,042	260	273	273	249	231	235	240	209
Copenhagen	561,000	142	149	143	179	197	151	128	118
Amsterdam	647,427	154	160	152	189	203	232	196	157
The Hague	353,286	147†	...	135	138	167	187	155	123
Rotterdam	510,538	147†	...	155	189	211	252	211	169
Brussels‡	775,039	198†	...	...	...	...	252†	...	...
Berlin	3,803,770	185	194	207	222	323	320	273	176
Vienna	1,841,326	323	315	362	407	479	476	527	405
Budapest	1,184,616	361	327	397	515	639	642	483	448
Prague	659,251	304	303	338	389	409	397	320	253
Leningrad+	1,962,443	286	299	306	319	331	355	438	504
Moscow	1,120,000	266	249	236	244	232	202	275	397
Kief	366,000	...	...	...	...	...	364	461	688
Warsaw	931,176	306	312	410	600	974	738	593	337
Lodz	447,714	...	...	...	...	1,164	775	604	...
Lwow	217,793	480	586	741	622	665	635	...	...
Cracow	178,386	487	473	480	750	908	845	616	...

\* All forms of tuberculosis. † Average annual rate, four year period 1911-1914. ‡ Five year period 1911-1915; § 1916-1920. + Pulmonary tuberculosis. Compiled generally from *Epidemiological Reports*, Health Section, League of Nations, or from official reports of cities listed.

Canadian pensioners of World War I—when 620,000 men enlisted—eventually 8,500 were pensioned for tuberculosis and 3,000 died from the disease. Miller further remarked that for every 100 men killed in action 6 died from tuberculosis; and, for every 100 pensioned for wounds, 25 were pensioned for tuberculosis.

#### IN EUROPE

In the United Kingdom, World War I not only interrupted the previous decline in the tuberculosis death rate but sent it up each year until 1919. The submarine warfare greatly reduced food supplies, especially in the great

cities of England, Scotland, and even of Ireland (Chart 1).

Whereas, in the pre-war year 1913, in England and Wales the death rate was 135 per 100,000, it rose to 162 in 1917 and to 169 in 1918. In London, in 1917 the rate was 211 and in Belfast 305. Taking as a conservative basis the tuberculosis death rate in 1914 of 136 in England and Wales and applying it to the population for the years 1915, 1916, 1917, and 1918, we find that instead of the 200,833 deaths which might be expected they actually numbered 21,327 more, or 222,160. In the single year of 1918 the number of new cases of tuberculosis notified or

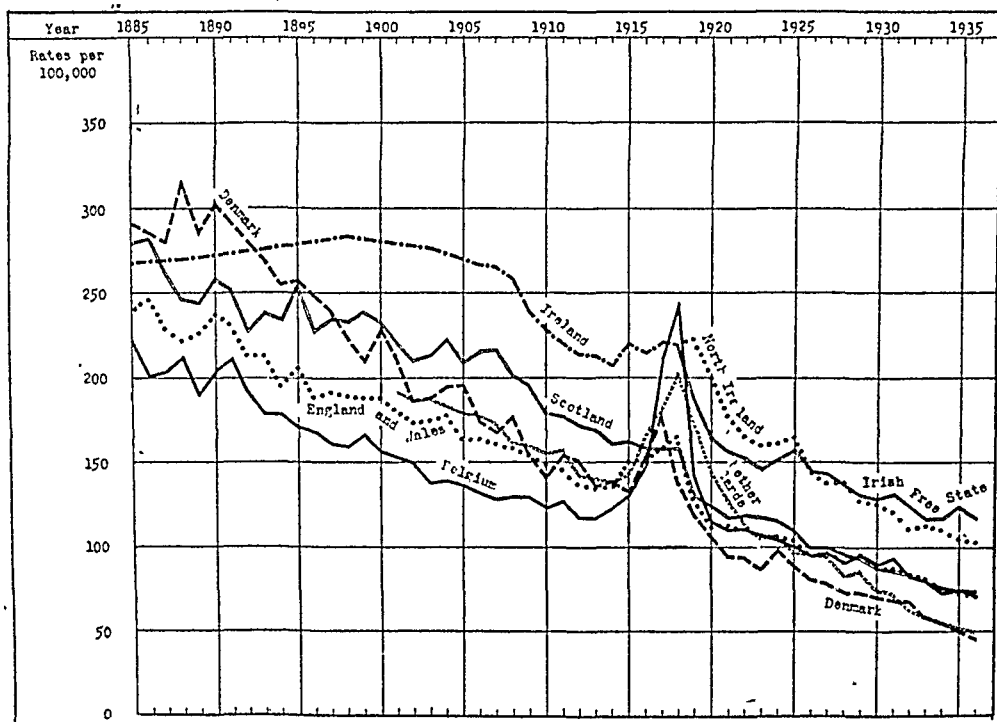


CHART 1—Tuberculosis Death Rates in Great Britain, Belgium, the Netherlands, and Denmark during Fifty Year Period 1885-1935

Based on data exclusively from *Epidemiological Reports*,  
Health Section, League of Nations

registered was 90,573. The war increase affected mainly the adult population 15 to 45 years of age, men more than women. Among females, the greatest increase was present in the age group 15 to 35.

In both Scotland and Ireland the effect of conditions during World War I was manifested in the maintenance of high tuberculosis rates rather than in an increase.

In France, even before World War I, high tuberculosis death rates were already prevailing. A material rise was recorded, at least in the non-invaded sections, only in 1918 when the rate was 243 per 100,000 as compared with 212 in 1913. France has always been successful in providing for most of its food requirements. We should, however, note the high tuberculosis death rate of 358 in Paris during the year

1917 when, for instance, in New York City ours was 188, or 170 points lower.

Occupied northern France, however, suffered definitely. And, while little information is available as to the tuberculosis situation then existing, we know that in the industrial city of Lille the tuberculosis death rate rose to 402 in 1917 and 540 in 1918. How abnormal this was can be realized when we notice that in 1920 the rate fell to 181.

During the four years from 1915 to 1918, in 77 departments of France tuberculosis alone caused 291,412 deaths.

Italy, which previous to World War I had a comparatively favorable tuberculosis death rate, saw its northern communes invaded by Austro-Hungarian forces and suffered a definite increase of tuberculosis. As against a death rate of 143 in 1913, the rate

rose to 175 in 1917 and 209 in 1918. And, whereas in most countries the post-war rate of 1920 was lower than the pre-war rate of 1913, here it remained at 160 compared with 143. In Rome, tuberculosis was rife and the rate in 1918 ran up to 392, or 75 per cent higher than only six years previously.

Altogether in Italy, during the four year period 1915-1918, tuberculosis deaths in the non-invaded sections totalled 254,469, or 47,095 more than would have been expected had the 1914 rate merely continued to prevail.

In war-swept Belgium, the tuberculosis death rate in 1918 was double that of 1914, 245 as compared with 124. And but for the emergency relief, organized at that time conditions would

have been worse. Here, even in the rural sections, the tuberculosis rates were as high as those in crowded large cities, the rate in Brussels, 252, being only 7 points higher than that of the country as a whole.

#### CENTRAL POWERS

The record among the principal Central Powers in World War I—Germany, Austria-Hungary, excepting Bulgaria and Turkey for which there are no figures available here—will always remain a classic instance of tuberculosis and war conditions, especially when there are marked deficiencies of food (Chart 2). In the pre-war year of 1913, Germany was experiencing one of its lowest tuberculosis death rates in a decade. The

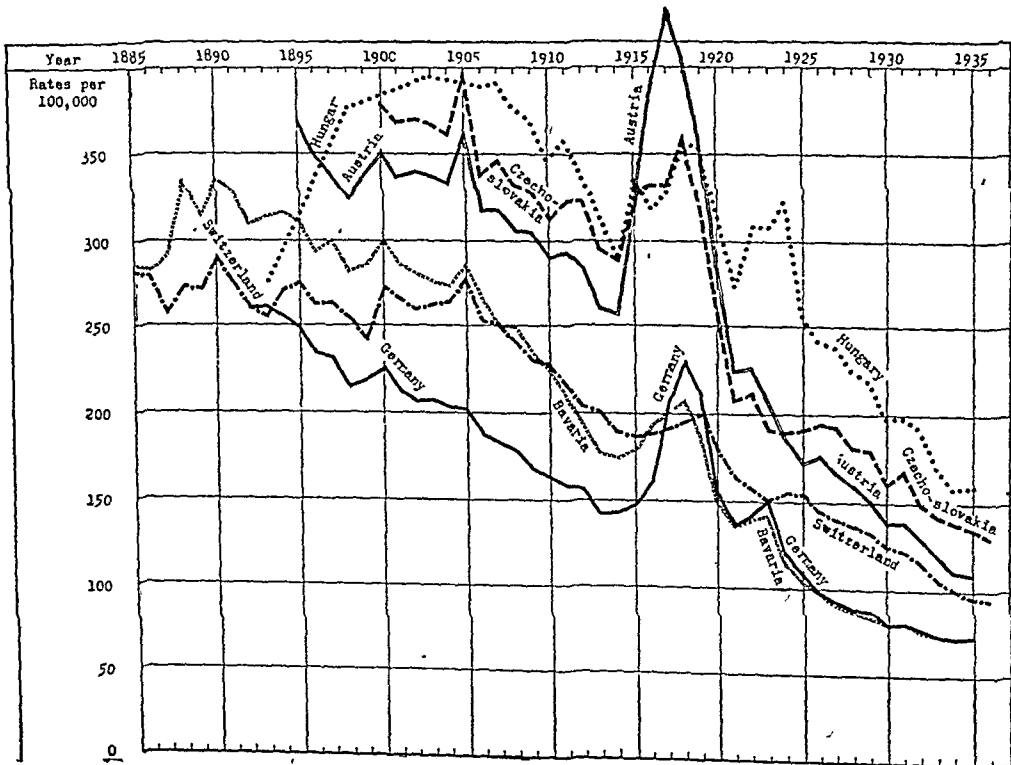


CHART 2—Tuberculosis Death Rates in Switzerland, Bavaria, Austria-Hungary, and Czechoslovakia during Fifty Year Period 1885-1935

Based on data exclusively from *Epidemiological Reports*,  
Health Section, League of Nations

TABLE 3

*Tuberculosis Mortality\* in 24 Different Countries  
in Pre-war, Mid-war and Post-war Years: 1913, 1917, and 1920*

Country	Pre-war 1913		Mid-war 1917		Post-war 1920	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
United States	142,838	148	150,194	147	121,459	114
Ireland	9,387	214	9,680	221	7,651	170
Scotland	8,073	169	7,680	159	6,038	124
England, Wales	49,476	135	55,934	162	42,545	113
Belgium	8,774	118	15,720	211	8,507	114
France†	84,443	212	71,247	211	66,824	185
Italy‡	52,864	143	62,167	175	57,848	160
Spain	30,116	152	35,586	172	38,425	180
Bavaria	12,479	177	14,237	200	10,800	151
Germany	94,927	143	133,223	206	92,793	154
Austria‡	75,379	259	130,049	432	18,812	284
Hungary‡	69,883	328	71,012	383	28,028	348
Czecho-Slovakia	41,434	296	45,624	331	35,555	261
Finland†	8,316	261	8,570	261	7,360	219
Norway	5,457	221	5,452	212	5,033	190
Sweden	10,428	185	11,289	195	9,564	162
Denmark	3,618	126	4,839	158	3,636	113
Netherlands	8,890	142	12,128	182	10,240	147
Switzerland	7,788	202	8,047	207	6,984	180
Japan	110,753	208	124,787	223	125,165	224
Philippines	18,392	228	22,849	250	26,474	275
Australia	3,800	81	3,364	66	3,607	67
New Zealand	812	76	755	69	851	71
South Africa¶	676	51	711	50	688	46

\* All forms of tuberculosis. † Pulmonary tuberculosis. ° Civilian population. ¶ White population. ‡ France, 77 non-invaded departments. Italy, 1917-1920, non-invaded communes. Austria, pre-war, 1913-1918; population, in 1911, 28,649,449; in 1920, 6,476,000. Hungary, pre-war, 1913-1918; population, in 1910, 20,792,709; in 1920, 8,054,000. Compiled from *Epidemiological Reports*, Health Section, League of Nations; *Annuaire Statistique France*; Official Yearbooks of certain countries listed, etc.

war and the blockade had first made their influence felt in 1914 by arresting progress. In 1915 the rate rose 6 points higher; in 1916, there was an increase of 12,000 deaths over the pre-war annual figures. Steadily the specter of tuberculosis rose and an increasing number of victims were taken in 1917 and 1918. In the latter year, 54,817 more deaths from tuberculosis occurred than in 1914.

The number of deaths from all forms of tuberculosis during the year ending the war, 1918, totalled 147,733 as against 92,916 in 1914. The death rate of 1918 was 229 as compared with 142 in 1914, representing a 60 per cent rise over that of four years previous. The death rate of 1920 was still higher than that of 1914, 154 against 142.

During the seven years from 1914

to 1920 inclusive, tuberculosis alone killed 800,000 people in Germany.

The 50,000,000 people of pre-war Austria-Hungary paid an even higher toll from tuberculosis than did the German people during World War I. It should first be remarked, however, that in those central sections of Europe high tuberculosis death rates were then prevailing. In 1913, the rate was 259 per 100,000 in Austria and 328 in Hungary; in the latter country, it rose to 410 in 1918. In Austria, the tuberculosis death rate of 1917, namely 432, exceeded that of 1913 by 67 per cent. In that mid-year of the war, the tuberculosis deaths in Austria numbered 130,049 as compared with 75,379 in 1913.

Everyone recalls the terror tuberculosis inspired in Vienna during the war years, the death rate going up

TABLE 4

*Tuberculosis Mortality\* in 34 Large Cities of the World  
in Pre-war, Mid-war and Post-war Years: 1913, 1917, and 1920*

City	Pre-war 1913		Mid-war 1917		Post-war 1920	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
New York	10,031	199	10,142	188	7,135	126
Montreal	1,073	215	1,088	195	1,100	182
Rio-de-Janeiro	4,045	417	4,217	392	4,608	394
Sao Paulo	533	117	650	124	634	110
Sydney	784	82	526	55	787	71
Melbourne	898	110	825	101	800	98
Tokyo	8,697	427	8,959	381	8,365	352
Bombay	2,152	219	2,118	216	1,841	187
Belfast	1,188	300	1,201	305	1,008	243
Edinburgh	540	159	575	151	417	102
London	5,863	165	6,768	211	4,675	129
Lille	662	306	869	402	391	181
Paris	10,975	385	10,184	358	7,907	272
Madrid	2,262	301	2,930	390	2,945	392
Rome	1,549	224	1,943	281	1,645	238
Helsinki	623	315	485	245	404	204
Oslo	589	228	501	194	540	209
Stockholm	1,097	260	975	231	882	209
Copenhagen	796	142	1,105	197	661	118
Amsterdam	997	154	1,314	203	1,016	157
The Hague	519	147†	590	167	435	123
Rotterdam	750	147†	1,077	211	863	169
Brussels‡	1,552	198‡	1,853	252‡	...	...
Berlin	7,037	185	12,286	323	6,695	176
Vienna	6,376	323	9,084	479	7,457	405
Budapest	4,276	361	7,570	639	5,307	448
Prague	1,638	304	2,485	409	1,668	253
Leningrad+	6,122	286	7,203	331	9,891	504
Moscow	4,508	266	4,296	232	4,450	397
Kief	...	...	*1,332	364	2,445	688
Warsaw	3,315	306	9,070	974	3,138	337
Lodz	...	...	5,097	1,164	2,704§	604§
Lwow	1,006	480	1,425	665	...	...
Cracow	778	487	1,548	908	...	...

\* All forms of tuberculosis. † Average annual rate, four year period 1911-1914. ‡ Five year period 1911-1915; § 1916-1920. + Pulmonary tuberculosis. ° Year 1918. § Year 1919. Compiled generally from *Epidemiological Reports*, Health Section, League of Nations, or from official reports of cities listed.

steadily from 315 in 1914 to 362 in 1915, 407 in 1916, 479 in 1917, 476 in 1918, reaching 527 in 1919 even after the war—and this mortality was only among civilians. In addition, there were almost a third as many other tuberculosis deaths in military hospitals of the city.

But how few of us are aware that conditions were even worse in Budapest. Official reports, which appeared subsequently, revealed tuberculosis death rates in Hungary's capital of 515 in 1916, of 639 in 1917, and of 642 in 1918.

A partial estimate of the additional deaths due to tuberculosis because of

World War I conditions in Germany and Austria-Hungary alone—not to mention their allies at that time, Bulgaria and Turkey—can again be made by applying the 1914 rate to the 4 year period of 1915-1918. The expected number of deaths should have been 905,376; instead the actual number recorded was 1,228,437, an excess during four years alone of 323,061.

The magnitude of this excess mortality due to tuberculosis in Austria-Hungary can be better visualized when we recall that all the American soldiers killed or who died during World War I, namely 126,000, were less than half of the number just quoted.



## RUSSIA, POLAND

Of other warring nations at that time, only the barest tuberculosis records are at hand for so large and important a country as Russia. There, war was followed by defeat at the hands of Germany, a second war with Poland, finally by revolution and famine. Conditions in Russia in 1920 were even worse than in 1917 or 1918.

Personal communications and figures which I received subsequently from Wedenskaya,<sup>6</sup> of the State Tuberculosis Institute, stated that in Moscow the death rate, which was 202 in 1918, rose only two years later, namely in 1920, to 397 or by nearly 100 per cent. In Leningrad, each year of the war and for a time thereafter, an increase in tuberculosis mortality was registered. Starting in 1914 at 299, the death rate was 306 in 1915, 319 in 1916, 331 in 1917, 355 in 1918, 438 in 1919 and 504 in 1920. At Kief, in the Ukraine, according to the Health Section of the League of Nations, an even more frightful death rate prevailed in 1920, 688 per 100,000 population.

The Polish people, caught in the whirlpools of war between, and with, both Germany and Russia, suffered most from tuberculosis; partial records are available for only a few centers of population. In Warsaw, the death rate in 1917 was treble that of 1913—974 compared with 306. In Lwow, the death rate reached 741 as early as 1915. In Cracow, the tuberculosis death rate in 1917 was 908, or nearly twice that of 1913. And, in Ldow, the incredible rate of 1,164 was attained in the mid-war year of 1917. Eleven persons out of every 1,000 living there died from tuberculosis in a single year.

## NEUTRAL COUNTRIES

Neutral countries, especially those neighboring on the war zones, felt and also registered a higher tuberculosis mortality from the effects of the

blockade and interference with the flow of commodities, especially food.

In Spain, the tuberculosis death rate rose steadily until 1918 and kept higher both in 1919 and 1920 than in the pre-war year of 1913. From 152 at first it went up to 172 in 1917 and to 180 in 1920. In Madrid, as against a rate of 301 in 1913, we find one of 392 in 1920.

In the Scandinavian group of Finland, Norway, and Sweden, at some time or other, each experienced during the war years high tuberculosis death rates or some increase.

Denmark and the Netherlands also paid a toll of lives to the Moloch of tuberculosis. In 1917, the tuberculosis death rate of the Danes, 158 per 100,000 population, was 25 per cent higher than in 1913.

In Holland, at the same time, the death rate rose from 142 to 182, or by 28 per cent. In Amsterdam, Rotterdam, and The Hague, the death rates were higher than usual throughout the war. According to Prinzing,<sup>7</sup> during the six years of 1915 to 1920 inclusive there were 67,639 deaths from tuberculosis in Holland among the 6,800,000 people then living in that country. In 1918, the death rate among men was 40 per cent higher than in 1914 and that of women had increased by 50 per cent.

A significant remark at that time might be quoted here: "During war-time, governments were generally careful at least to assure sufficient food for the soldiers at the front, whereas for the civilian population and the women it was limited and rationed."

Even in far-off Japan the decline of tuberculosis was delayed by World War I. Higher rates than in 1913 prevailed throughout the war years. That nation paid a high price for the hard conditions under which its people labor. In 1918, the death rate in Tokyo was 430; women suffered even

more than the men. More than half of the deaths in females occurred among girls and young women between the ages of 10 and 30.

\* \* \*

We are told that among the armed forces of the entire British Empire in World War I, which lasted more than four years, 908,371 soldiers were killed or died. In the twenty-four countries to which we have been referring and which do not include Russia, during the single year of 1917—not the worst year which was 1918 but which I am not stressing because of the influenza pandemic—there were recorded in just twelve months 1,005,144 deaths from tuberculosis alone.

#### REFERENCES

1. Drolet, Godias J. Present Trends of Case Fatality Rates in Tuberculosis. *Am. Rev. Tuberc.*, 37, 2:125-151 (Feb.), 1938.
2. Wolford, Roy A., Col. M.C., A.U.S. *Proceedings, Fortieth Annual Meeting*, National Tuberculosis Association, Chicago, May, 1944.
3. Spillman, Ramsay. The Value of Radiography in Detecting Tuberculosis in Recruits. *J.A.M.A.*, 115:1371-1738 (Oct.), 1940.
4. Smiley, Dean F., and Raskin, Herbert A. Tuberculosis as a Naval Problem—An address before the Southern Chapter. *Am. College Chest Physicians*, Cincinnati, O., Nov. 17, 1943.
5. Miller, A. F. The New Knowledge of Tuberculosis. *Canad. M. A. J.*, 50:243 (Mar.), 1944.
6. Wedenskaya, Natalie. Personal communication, June 26, 1926.
7. Prinzing. *Beitr. z. Klin. d. Tuberk.*, 50:505-522.

Appreciative acknowledgment is made of the assistance given by Mrs. R. D. Hart in the compilation of the widely scattered records required for this review.

---

## Medical Care Versus the Draft

Testimony on June 13 before the House Committee on Postwar Military Policy in Washington related to the enactment of legislation requiring peacetime training.

According to the *New York Times*, Lewis G. Hines, speaking for the American Federation of Labor, told the committee that if health and discipline were the objectives of the proposal, then the government should provide a health program that would benefit citi-

zens before they reach military age, and that the nation should look to the family, the schools, the church and community institutions for discipline.

"We believe," he said, "that it is very important to the national welfare, especially from a military standpoint, that more adequate medical care be given to the children of the nation, in order that they may be fit to serve their nation's need upon reaching the age of maturity."

# Problems of Morbidity Reporting from the Standpoint of National Public Health Activities\*

G. ST. J. PERROTT, F.A.P.H.A.

*Division of Public Health Methods, U. S. Public Health Service, Washington, D. C.*

ALL here will agree that adequate knowledge of the amount and kinds of illnesses which currently affect the population is a prerequisite of any rational public health program. Furthermore, it is generally recognized that the two main sources of data which we possess on the subject: official mortality and morbidity statistics, fail to give us sufficient knowledge.

The essential limitations of mortality statistics are in the nature of the data and cannot be corrected by those who collect them. No matter how accurate and complete mortality statistics are, they can furnish direct knowledge of only a few of the health problems of a population, and, at best, inferential information about some others. Mortality statistics can tell us how many persons die from a specified disease in a given period but cannot tell us exactly how prevalent the disease is during that period. The limitations of mortality statistics as a measure of prevalence become more apparent as therapeutic medicine progresses. When by the introduction of new drugs—for example, the sulfa drugs in relation to meningitis—the fatality rate of a disease diminishes considerably, data on deaths from the disease will reveal even

less the extent of the problem of its prevention and control.

On the other hand, there does not appear to be any theoretical reason why official morbidity statistics should not furnish us with comprehensive information on the state of health of the population. Yet we are all aware that morbidity reporting as it is now being carried out has many defects and fails to achieve this objective.

In the first place, morbidity reporting has been and still is mainly concerned with infectious diseases. Second, statutes relative to the kind of diseases to be reported vary from state to state. In the third place, the completeness of reporting varies in relation to disease, and from state to state. Thus we find that when the reports made to the U. S. Public Health Service are compared with results of surveys, the case rates show a deficiency of 70 per cent for scarlet fever, and 80 to 90 per cent for measles and whooping cough. All of these defects limit considerably the value of the reports. As a consequence, when information is really desired about disease prevalence or incidence, costly studies have to be undertaken to furnish the data which should have been available from the reports already collected.

To correct the defects of morbidity reporting will undoubtedly be a difficult undertaking. It will require the

\* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

solution of many kinds of problems in all fields of public health activities from diagnostic techniques to administration and law.

Among these problems the more important are those concerning:

1. *Completeness of reporting*—Two main problems must be considered. The first arises from the fact that a certain proportion of sick persons never call a physician or nurse, or visit a clinic or hospital. This proportion will vary according to the socio-economic status of the population, the medical facilities available, and the nature of the diseases themselves. The minor respiratory diseases are in general seen relatively infrequently; accidental traumas are attended in almost all cases.

The problem here is how to measure the proportion of unattended cases of a specified disease in a population. It is clear that controls of some kind must be set up for the purpose. This means utilizing other and independent sources of information on sickness, such as school and industrial sickness records. The feasibility of using these sources for control deserves investigation, as does the practicability of periodic spot surveys on a sample population.

Another problem results from the variation in reporting on the part of the physicians. There are penalties of various degrees for omission in reporting, but these penalties are for the most part a dead letter. In view of this, the question arises: "Why fill statute books with such law?" It would seem wiser to investigate why some physicians do not comply, and to work out arrangements that will assure their coöperation. It is doubtful that omission on the part of physicians is often a deliberate attempt to flout the law. Probably it is lack of appreciation of the value of such reports, or it may be due to the additional clerical work involved. If either or both of these explanations be correct the situation

could be remedied in various ways. Among others, it might be well to experiment further with granting nominal compensation for the reports. In addition, and more important, the reasons for lack of interest on the part of physicians should be carefully examined and, when necessary, procedures should be initiated to stimulate their interest and coöperation. In any event, the need for some measure of reporting completeness on the part of physicians and institutions is just as important as for the cases not seen by physicians. The feasibility of the controls mentioned above should be investigated for both aspects of incompleteness of reporting.

2. *Characteristics of the diseases reported*—Another series of important problems arises in relation to the kinds of diseases to be included in morbidity reporting. Recently there has been a tendency in many states toward reporting non-infectious diseases. Thus certain occupational diseases are reportable in some states, and cancer in a few.

From the standpoint of obtaining statistics for the state of health of the country as a whole it would be desirable to have all states report certain important diseases. This requires definition of what constitutes an important disease in relation to public health work. Some agreement will have to be reached on the matter, taking into account the frequency of the diseases, the fatality and disability connected with them, and their preventability. Foremost in mind should always be that any list is not final, but should be altered as conditions demand it. In particular, it is well not to increase indefinitely the list of reportable diseases. Instead, thought should be given as to whether there are diseases which could or should be dropped because of the difficulty in obtaining accurate and complete data or because of their lack of significance relative to public health work.

Another important problem in this

series concerns the accuracy of the diagnosis of the disease reported. It is obvious that, for the study of trends or for comparisons between communities or states, it is necessary to know whether we are dealing with data confirmed by laboratory and other tests or not. It is particularly true in the case of epidemic or endemic diseases, the reporting of which is often influenced by local conditions. During influenza epidemics any upper respiratory infection is apt to be diagnosed as influenza, and in areas of malaria prevalence all aches and pains are malaria. It would seem logical that reports should indicate whether the diagnosis has been confirmed by some standard means.

Another and equally important problem is that of including in the morbidity reporting certain chronic diseases of public health significance. In this connection we have also the question of defining what should be reported: new cases only, cases in the early stages, recurrent manifestations, or those in late stages. At present we do not have the faintest notion whether for such diseases as malaria or syphilis we are dealing with prevalence or incidence. To give real meaning to the data this information should be indicated in some manner.

3. *Characteristics of the individual*—The age, sex, race, occupation, are all elements of importance for an accurate picture of the morbidity in an area and for comparison among states or local areas.

To record and report such information as well as more accurate data on the characteristics of the disease would require revision of reporting forms and of filing systems in many county and local health units and even in some state health departments.

I have outlined some of the major problems concerned with morbidity reporting. These problems are rather obvious to anyone who has given thought to the possibility of improving morbidity reporting. In summary, these problems concern:

1. Measurement of the level of under-reporting
2. New methods for getting better coöperation from physicians and institutions which furnish data
3. Selection of diseases to be reported from all states
4. Reporting and recording certain characteristics about the diseases and individuals in order that the data will have greater value as a measure of the state of health of the nation

Notwithstanding their complexity, there is no doubt that we have at hand the means to solve these problems, but it will require the coöperative efforts of all concerned with public health: the U. S. Public Health Service, the state and local health departments, and the physicians and hospitals. Therefore, in addition to considering the specific problems mentioned we should also consider how best the needed coöperation can be achieved.

# Applications of the Complement-Fixation Test in the Study of Rickettsial Diseases\*

IDA A. BENGTON, PH.D.

*Senior Bacteriologist, National Institute of Health, Bethesda, Md.*

TESTS employed for the identification and differentiation of rickettsial diseases include immunity tests in animals, the Weil-Felix test and the complement-fixation test.

Immunity tests in guinea pigs were performed by Anderson and Goldberger in 1912<sup>1</sup> in studies on European typhus and in experiments to determine the relationship between Brill's disease and Mexican typhus. Since that time immunity and cross-immunity tests in guinea pigs have been employed extensively in the study of rickettsial diseases and much valuable information has been gained. However, from the standpoint of the diagnosis of a case of suspected rickettsial disease, these tests require an extended period of time and often fail to yield conclusive results. In the first place, it may not be possible to establish infection in the guinea pig because the blood from the patient may not have been obtained at a favorable time and the amount of the virus in the blood may not be sufficiently concentrated. If the guinea pig becomes infected, sufficient time must then elapse for recovery from the infection (2-3 weeks) before the challenge dose of known virus is administered. Another

period of 1 to 2 weeks is required before it can be determined whether the guinea pig has developed a second infection or is immune.

The Weil-Felix test discovered in 1916<sup>2</sup> has been exceedingly valuable as a rapid diagnostic test both because of its simplicity and because of the remarkable accuracy with which it detects rickettsial infection. However, after long continued use it has been shown to have certain limitations and shortcomings. There has always been a question as to the significant titer. Weil and Felix regarded a titer of 1/25 as early presumptive evidence of typhus and 1/50 as definite evidence of infection. Now the tendency is to consider only a titer of above 1/80 as significant. The test was regarded for a number of years as highly specific for typhus, but Kerlee and Spencer (1928),<sup>3</sup> and Spencer and Maxcy (1930)<sup>4</sup> found it was positive also in a large proportion of cases of Rocky Mountain spotted fever. Since then it has been generally accepted that the Weil-Felix test does not differentiate between the two diseases.

The complement-fixation test for the diagnosis of rickettsial disease has the advantage of the rapidity of the Weil-Felix test, it is comparatively simple, and is more specific. This test could only be employed extensively after it was possible to obtain large amounts of

\* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

[illegible]

night and the results are read the following morning.

*Results of the complement-fixation test in 330 positive human sera*—Among approximately 1,000 sera tested for both Rocky Mountain spotted fever and endemic typhus, 330 were positive by the complement-fixation test for one or the other of these diseases. The titers of these sera ranged from 1/4 to 1/8,192 (Table 1). In the great majority of the tests there was complete specificity, with no cross-fixation whatever. Among 216 sera positive for Rocky Mountain spotted fever, 92.1 per cent showed no cross-fixation, 3.7 per cent slight cross-fixation (in dilutions 1/4 to 1/8), while 4.1 per cent showed cross-fixation in dilutions higher than 1/8 but with differences of 2 to 5 twofold dilutions in the results with the two antigens. Among 114 sera positive for endemic typhus there was no cross-fixation in 80.7 per cent. There was slight cross-fixation in 9.6 per cent (in dilutions 1/4 to 1/8) and cross-fixation in dilutions higher than 1/8 in 9.6 per cent, but with differences of 2- to 8 twofold dilutions in the results with the two antigens.

Even though a comparatively small number of tests have been made, the

results shown indicate that the test as performed is somewhat more specific for Rocky Mountain spotted fever than for endemic typhus. Further consideration is being given the matter of the cross-fixation reactions referred to. The possibility of previous apparent or inapparent infection on those cases in which it occurs is being investigated. In some cases a previous vaccination history, as in soldiers or laboratory workers, should be considered. If there is a true antigenic relationship between the two diseases, elimination of the common antigenic factor by special means, as by the use of absorption tests or by the use of purified antigens, will probably yield results which are more specific.

*Comparative data on the Weil-Felix and the complement-fixation tests*—Although a positive Weil-Felix test may often be in evidence earlier in cases of rickettsial disease than a positive complement-fixation reaction, still a certain number of cases develop a positive complement-fixation reaction first. Among 322 sera tested diagnostically by both reactions 77, or 23.9 per cent, were positive by the complement-fixation test and negative by the Weil-Felix test. The complement-fixation titers of these sera varied from 1/4 to 1/8,192 (Table 2).

In contrast to those cases which have a positive complement-fixation reaction and which are negative by the Weil-Felix, certain cases which are clinically rickettsial infections may give a high Weil-Felix reaction and a low or atypical complement-fixation reaction. Usually second or third specimens taken after a longer period will yield more definite results. A type of reaction which occurs occasionally is one in which there is partial fixation to fairly high dilutions but no complete fixation in any. One particular case with a known laboratory infection with epidemic typhus persistently showed re-

TABLE 2

77 Early Cases among 322 showing a Positive Complement-fixation Reaction and a Negative Weil-Felix Reaction

Complement-fixation Titers	No. of Sera Positive	
	Rocky Mountain Spotted Fever	Endemic Typhus
1/4	1	0
1/8	5	1
1/16	5	2
1/32	5	2
1/64	6	7
1/128	2	6
1/256	6	5
1/512	8	3
1/1,024	2	0
1/2,048	5	0
1/4,096	1	0
1/8,192	3	2
Total	49	28



TABLE 3  
*Atypical Complement-fixation Reactions*

Number	Serum Dilutions								Weil-Felix Titer
	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512	
	Antigen Diluted as Usual								
10,176	1	1	2	1	1	1	1	1	1/5,120
10,178	1	1	tr	tr	tr	tr	tr	tr	1/2,560
	Antigen Four Times as Concentrated								
10,176	4	4	4	3	3	2	1	1	
10,178	4	4	4	3	3	2	1	tr	

sults in which fixation was not entirely complete in any dilution. Successive specimens from several other cases have shown a similar tendency.

There are several methods of approach to the solution of the problem of the atypical reactions referred to. By increasing the concentration of the antigen over that usually employed, a more typical reaction may sometimes be obtained (Table 3).

The test may also be rendered more sensitive by reducing the amount of complement and by icebox fixation.

On the basis of the above considerations it therefore appears that the two tests supplement each other. In the great majority of cases good agreement is obtained with both tests when they are used for purposes of diagnosis. This does not mean that comparable titers are obtained, but that significant titers are. On the other hand, if a

high Weil-Felix titer is obtained with a low complement-fixation titer, this immediately suggests the testing of a later specimen or retesting the same specimen in such a way as to render the test more sensitive. *Proteus* infection should also be considered. A high complement-fixation titer with a low Weil-Felix titer may be considered as evidence of rickettsial infection without further testing.

*Epidemiological value of the complement-fixation test*—From the epidemiological standpoint a test which indicates past infection is of value. The persistence of the complement-fixation reaction in the serum of patients, long after recovery, has been given some consideration in previous reports, but a further presentation of results obtained in some of these tests may be of interest (Table 4).

The Weil-Felix test in all instances

TABLE 4

*Old Cases of Rickettsial Disease with a Positive Complement-fixation Reaction but Without a Significant Weil-Felix Reaction*

No.	Date Tested	Years After Onset	Nature of Illness and Date of Onset	Complement fixation			Weil Felix OX-19
				Endemic Typhus	Rocky Mt. Spotted Fever	Epidemic Typhus	
371	August, 1942	1	Suspected R.M.S.F., 1941		1/64		1/20
1,111	September, 1942	3	R.M.S.F., 1939		1/16		0
1,297	October, 1942	6	Typhus-like infection, 1936	1/32			1/80
1,967	December, 1942	1	Endemic typhus, October, 1940	1/64			1/40
3,267	March, 1943	25	Epidemic typhus, 1918			1/16	1/10
4,297	June, 1943	7	R.M.S.F., 1937		1/16		1/10
4,298	June, 1943	5	R.M.S.F., 1939		1/128		1/10
9,547	July, 1944	3	R.M.S.F., June, 1941		1/16		0
9,548	July, 1944	1	R.M.S.F., July, 1943		1/128		1/20
9,626	July, 1944	4	R.M.S.F., May, 1940		1/16		0
9,627	July, 1944	3	R.M.S.F., August, 1941		1/8		1/20

was too low to be of significance but the complement-fixation reaction showed a significant titer. While a positive titer is not obtained in all cases of past human rickettsial infection, data collected thus far indicate that a positive result by complement-fixation may be expected in a large percentage of cases, while negative results or low titers which are not significant are often obtained with the Weil-Felix test after a period of 6 to 12 months.

*The complement-fixation test for determining evidence of typhus infection in wild rats*—A report has recently been completed by Dr. Brigham and the writer<sup>7</sup> on the complement-fixation and Weil-Felix tests in wild rats as related to the isolation of the virus of endemic typhus fever from these rodents. As is the case in humans, the complement-fixation reaction persists for a longer time in typhus infected rats than does the Weil-Felix reaction. It was shown by Dr. Brigham that following the inoculation of white rats with a known strain of typhus, the Weil-Felix reaction appeared about the 6th day and persisted for about 15 days, after which time it was completely negative. The complement-fixation tests on the same sera were positive until up to 10 months when the experiment was terminated. Isolation of the virus from the brains of guinea pigs inoculated with blood from the infected rats was successful up to 6 months, and correlated perfectly with the results of the complement-fixation test.

The serological data obtained as the result of the tests on wild rat sera showed that the Weil-Felix reaction was positive in 64 (1.9 per cent) of 3,430 rat sera tested, while of 1,392 sera subjected to both the Weil-Felix and the complement-fixation test 651 (46.7 per cent) were positive by the complement-fixation test and 51 (3.6 per cent) were positive by the Weil-Felix test. Isolations of virus were also attempted

from the wild rats. The brains of 1,958 rats were inoculated, by pools, into guinea pigs, the results indicating at least 0.87 per cent active infection. Among 350 brains inoculated singly there were 30, or 8.5 per cent, which gave positive isolations. A positive complement-fixation reaction was obtained in 25 of 26 of the corresponding rat sera.

Since the completion of the study described, approximately 1,000 rat sera from other typhus areas have been received for testing at the National Institute of Health. The percentage of those positive by the complement-fixation test is comparable with those obtained in the investigation just discussed while the number showing a positive Weil-Felix reaction has been practically negligible.

It is therefore apparent that the Weil-Felix test is of little value as an indicator of infection in wild rats in this country. The reaction is probably evanescent in the wild rat as it has been shown to be in white rats experimentally infected. Possibly it is the young rats which usually acquire the infection and these are probably not used as often for purposes of collecting blood specimens as the older and larger rats.

The high percentage of positive results by complement-fixation in rats from endemic typhus areas suggests the use of this test for obtaining presumptive evidence to determine which form of the disease may be present in areas where it is a question whether the disease is epidemic or endemic typhus. Positive complement-fixation results in the sera of wild rats would point to endemic typhus. Negative results would indicate the absence of endemic typhus with the possibility that the disease might be epidemic typhus, since this wild rat is not known to be the reservoir of this disease. The results would thus suggest control measures

to prevent the spread of the particular form of typhus occurring in the locality in question. It might be necessary to examine a considerable number of rats, but if these are trapped in locations where cases of typhus have occurred it should not be difficult to obtain the desired information.

*The complement-fixation test as a routine diagnostic test*—The question has been raised whether it would be feasible for a diagnostic laboratory to adopt the complement-fixation test as a routine measure for testing sera from cases of suspected rickettsial disease and also from rats in typhus areas. The principal obstacle standing in the way of attaining this objective has been the lack of sufficient antigenic material, particularly the antigen for testing for Rocky Mountain spotted fever. The problem of sufficient antigen for testing for endemic typhus is less difficult as very satisfactory tests have been obtained by the use of epidemic typhus vaccines as antigens. The considerable amount of cross-fixation occurring between epidemic and endemic typhus with antigens prepared much as epidemic typhus vaccines are prepared, though a disadvantage in so far as differentiation between these two diseases is concerned, is an advantage in testing sera for endemic typhus, if other endemic typhus antigens are not available. On the other hand, it is quite probable that specific antigens will be available in the near future.

As to the techniques of the test, laboratories which are equipped to do Wassermann tests should have no difficulty in performing this test. It is not advocated that complement-fixation testing for rickettsial disease should replace the Weil-Felix test, but the additional information gained with the complement-fixation test should justify its use. The test is more specific and titers even as low as  $1/4$  may be considered significant. In this connection

it may be stated that numerous control tests have been made at the National Institute of Health which support this view. For a period covering approximately a year all sera received at the National Institute of Health with requests for agglutination tests were also tested for complement-fixation against endemic typhus antigen. Of 292 sera including 27 positive for tularemia, 6 positive for undulant fever, 7 positive for typhoid and paratyphoid fevers, and 252 negative by all tests, none showed a positive complement-fixation test against endemic typhus antigen. Also approximately 150 sera from patients with atypical pneumonia yielded negative results when tested against an endemic typhus antigen. Also negative results have been obtained in several hundred known normal sera tested against endemic and epidemic typhus antigens.

#### SUMMARY

An analysis of the results obtained in the testing of 330 human sera which were positive by the complement-fixation test for either endemic typhus or Rocky Mountain spotted fever is presented. In 92.1 per cent of the 216 spotted fever sera tested there was no cross-fixation with endemic typhus antigen although titers as high as  $1/8,192$  were obtained in some of the tests. There was slight cross-fixation ( $1/4$ – $1/8$  dilutions) in 3.7 per cent and higher cross-fixation in 4.1 per cent, though this as a rule was in higher titered sera. Among the 114 endemic typhus fever sera there was no cross-fixation whatever with Rocky Mountain spotted fever antigens in 80.7 per cent, slight cross-fixation ( $1/4$ – $1/8$  dilutions) in 9.6 per cent, and cross-fixation above  $1/8$  in 9.6 per cent.

In tests on sera from wild rats trapped in endemic typhus areas, positive complement-fixation reactions for endemic typhus showed evidence of in-

fection in a high percentage of the rats (up to 46.7 per cent in one group) while the Weil-Felix test was positive in low percentages (3.6 per cent in one group and in an almost negligible percentage in another).

The complement-fixation test was found to furnish evidence of rickettsial infection earlier than the Weil-Felix test in 23.9 per cent of the human sera tested. From an epidemiological standpoint the complement-fixation test is superior to the Weil-Felix test because a positive complement-reaction persists longer both in humans and in wild rats than does a positive Weil-Felix reaction.

Low titers are significant in the complement-fixation test as indicated by negative results on a number of non-rickettsial and normal sera.

It may be considered feasible for diagnostic laboratories to employ the

complement-fixation test as a routine procedure in the diagnosis of rickettsial disease, when antigens are more readily available.

#### REFERENCES

1. Anderson, John F., and Goldberger, Joseph. Studies on Immunity and Means of Transmission of Typhus. *Hyg. Lab. Bull.* No. 86, 81 (Oct.), 1912.
2. Weil, E., and Felix, A. Das serologische Diagnose des Fleckfiebers. *Wien Klin. Wchnschr.*, 29, 2:33 (Jan. 13), 1916.
3. Kerlee, A. L., and Spencer, R. R. Rocky Mountain Spotted Fever. A Preliminary Report on the Weil-Felix Reaction. *Pub. Health Rep.*, 44, 4:179 (Jan. 25), 1929.
4. Spencer, R. R., and Maxcy, K. F. The Weil-Felix Reaction in Endemic Typhus Fever and in Rocky Mountain Spotted Fever. *Pub. Health Rep.*, 45, 9:440 (Feb. 28), 1930.
5. Cox, H. R. Use of Yolk Sac of Developing Chick Embryo as Medium for Growing Rickettsiae of Rocky Mountain Spotted Fever and Typhus Groups. *Pub. Health Rep.*, 53, 51:2241 (Dec. 23, 1938), 1939.
6. Bengtson, Ida A. Complement-fixation in the Rickettsial Diseases—Technique of the Test. *Pub. Health Rep.*, 59, 12:402 (Mar. 24), 1944.
7. Brigham, George D., and Bengtson, Ida A. A Study of the Complement-fixation and Weil-Felix Reactions in Wild Rats as Related to the Isolation of the Virus of Endemic Typhus. *Pub. Health Rep.*, 60, 2:29 (Jan. 12), 1945.

## Tuberculosis Trends

Concern about the trend of the nation's death rate from tuberculosis, which shows increases concentrated in the industrial states of the northeast and north central sections of the country, and declines in the South and West, is being expressed by medical authorities and by the public.

It is possible that the population upheaval due to war work, which has no parallel in American history, will affect the trend of tuberculosis mortality for years to come. Only a new population census can provide the answer, but no census will be worth while until the people have had a few years to settle down after the war. These are

the highlights of a survey made by Mary Dempsey, Statistician of the National Tuberculosis Association, New York, just released by the New York Tuberculosis and Health Association.

G. J. Drolet, Statistician of the local Association, stated that according to complete reports gathered by the Bureau of Records, Department of Health, New York City, which include death of New Yorkers both in town and out of town, there has been an increase of 8 per cent in the tuberculosis mortality during the past three years. Deaths from tuberculosis of New York City residents, anywhere, in 1942 were 3,946; 1943, 4,183, and 1944, 4,267.

# Mental Hygiene in a Public Health Program — Its Implications\*

C. F. McCLINTIC, M.D.

*State Commissioner of Health, Williamsburg, W. Va.*

MORE than fifty years ago an English neurologist published a paper in the neurological magazine, *Brain*, dealing with "Cerebral Manifestations in Visceral Disease." Included in the discussion were cardiac and gastrointestinal conditions. Recently an article appeared in the *Journal of the American Medical Association* describing a psychotic syndrome as a prodromal manifestation of malignant growths in the chest. Nolan D. C. Lewis has stated: "Those who neglect to take into account the psychological factors in disease should be reminded that psychological energy works through physical structures and produces physical effects . . ." In view of these statements one need not hesitate to include mental illness among those with which public health workers should concern themselves.

It is not the purpose of this paper to discuss mental hygiene in its application to institutional cases but only as it relates to the emotional and social adjustments of people who are found in our ambulatory population in everyday life. The main objective of mental hygiene in a public health program is the prevention of social maladjustments which eventually become social and economic handicaps to the individual

and which may result in the individual becoming a ward of the state or a burden to near relatives. We might add that even this is the negative side of the objective because it has been demonstrated that mental hygiene programs have not only prevented individuals becoming dependent but they enable them to make their emotional and social adjustments so that they become a social and economic asset to society instead of a liability. The results are neither negative nor neutral, but positive.

With few exceptions, the awareness of the value of mental hygiene has been lacking among the greater part of our people and even among social minded individuals. One of the positive benefits of the present world catastrophe is that it has brought to our attention the magnitude of the problem of mental ill-health. As a result of the cases discovered through selective service we are forced to the conclusion that "institutionalized insanity," which costs us perhaps \$770,000,000 annually, is only a small part of the mental illness problem, and probably the least expensive.

It is estimated that approximately 25,000,000 of our young men have been called by the draft boards. Of these about 10,000,000 have been rejected as physically unfit for combat duty, and of this number, 3,000,000 were rejected because they were not mentally fit. Contrast this number with the less

---

\* Presidential Address delivered before the Twelfth Annual Meeting of the Southern Branch American Public Health Association in St. Louis, Mo., November 13, 1944.

than 1,000,000 in our welfare institutions and you can gain some idea of the size of the problem. Remember too, that these young men constitute only one segment of our population of 130,000,000. When we apply the above ratio to those who are older and younger in both sexes, it staggers the imagination.

Our job is to reduce the amount of mental illness by a program of prevention. This program should be so planned that it will begin with the unborn child. Do not take this statement to mean that your speaker is one of that group who believes that if a pregnant mother concentrates on playing the piano during gestation that she will give birth to a musical genius or if she mourns over the death of a pet rabbit that her new-born will arrive with a harelip. But every child is entitled to be born into an environment which is congenial to its mental, moral, and social development. This means, therefore, that a program of mental hygiene in its application should begin with the parents and continue with the child through adolescence and until he has made his permanent social adjustments. This does not mean that the program should be limited to the period just mentioned, but you will doubtless agree that more can be accomplished in the way of prevention within these age limits than at any other period in the life of the individual because of the potent influence of the parents and early environment on mental development.

From these general observations let us consider the implementation of a mental hygiene program. The implemented program is a triad. First, prevention; second, clinical services—including (a) child guidance, (b) dealing with pre-psychotic adults, (c) consultative service; and, three, education and community organization.

This outline does not necessarily mean that the program should be insti-

tuted chronologically in this order. Education and community organization may be the first in order in the establishment of the program. The first obstacle to be overcome is "sales resistance." The public mind must first be disabused of the stigma of mental illness in order to induce people to advocate and take advantage of the services. Mysticism must be dissipated. No other ailment is so shrouded in mysticism and superstition. They are as deeply ingrained as are the superstitions of ghosts, witches, black cats, banshees, walking under a ladder, and other superstitious ideas in our folklore.

Fortunately in every community we find those well established public and private social agencies through which an approach can be made. In some instances we can enlist the aid of the local medical society. The local agencies which are most helpful are those which can make use of the clinical services in solving some of their perplexing problems. Among these are: (a) child welfare, (b) probation department, (c) juvenile courts, (d) public assistance, (e) the schools, and (f) the medical profession.

That these agencies are interested and use the facilities of the clinic is well illustrated by the preliminary report of George M. Lott on the work of the Suffolk clinic on Long Island, N. Y. In his report on the first two hundred cases to which services were rendered for the local agencies, the distribution was: 25 per cent were examined for the juvenile court and probation department; another 25 per cent for the county's social agencies; 50 per cent were studied for the schools and family physicians; 66⅔ per cent of the total were school children; 11 per cent were educational or learning disabilities; only 14½ per cent were found to be mentally deficient; 4½ per cent were cases of psychosis; 6 per cent neurotic; 5 per cent had physical defects; 33 per

cent were behavior and social problems.

This analysis plainly indicates why these agencies are interested, and points to the need and emphasizes the value of mental hygiene when properly utilized by these agencies. In other words, these are the implications of a mental hygiene program in a public health service.

#### JUVENILE DELINQUENCY

Looking further into these implications it is to be observed that for years juvenile delinquency has been one of our most serious social problems, and it is said to have increased 42 per cent since 1940. Last year it increased 30 per cent. Yet, a Detroit juvenile judge with an experience in this field extending over a third of a century emphasizes the fact that "every problem child has a problem parent." To discuss parental influence and home environment in relation to juvenile delinquency would exceed the limits permitted in this discussion. But let me impress upon you that 95 per cent of the men and boys in prison in the United States have been guilty of juvenile delinquency before they reached 15 years of age and that 85 per cent of the men and boys and 90 per cent of the women and girls in our prisons have come from broken homes.

The subtle influence of home environment plays an immense part in contributing to child delinquency. Let me cite briefly the case of a boy before a juvenile judge as an illustration. Due to a difficult labor when born and the lack of trained obstetrical care, the child lost one eye, with consequent disfigurement of the orbit. As a result, the thoughtless parents very innocently, along with the children of the family who were physically normal, nicknamed this child "Blinkey." When he entered school, his schoolmates took up the name and applied it in a disparaging manner. When he reached

adolescence he developed a defense reaction against his handicap and became a nuisance in the community as a petty thief. He finally landed in juvenile court. There, after a careful case study by the staff which included social workers, psychologists, and psychiatrists, the judge arrived at the conclusion that his crimes were due to his disfigurement and the attitude of his associates. So instead of sending the boy to prison he appealed to a local service club to finance an operation and secure for the boy an artificial eye, since his parents were not able to bear the expense, in order to alleviate his handicap. Following this his delinquency ceased. He continued through high school and is now successfully employed. This is just one of scores of similar cases which have been reclaimed by careful psychological and psychiatric study with proper treatment. A juvenile judge in New Jersey reports 500 cases which were successfully handled in this way with only one failure, and he excused that one because of the parents being responsible for the child violating his probation.

Assuming that only 50 per cent of the children guilty of juvenile delinquency can be saved by proper case work and the application of mental hygiene therapy, millions of dollars would be saved and an unbelievable decrease in crime would result.

#### PERSONS ON RELIEF

The implications are just as alluring in the field of our social agencies as they are in juvenile delinquency. Among those on relief rolls are thousands with inadequate personalities. In the physical examination of large groups of people who were employed on WPA work it was discovered that 85 per cent of them had some form of disability and, assuming that their mental status was as good as that of the men called by the selec-

tive service boards, we can form some estimate of the part that mental disability played in rendering these people economically dependent.

A physical examination of the inmates of the insane asylums of California some years ago revealed that 90 per cent of them had organic ailments which were masked by their mental condition. Poverty plays a part in mental illness as indicated by a recent report by a distinguished psychiatrist which points out that schizophrenia is more prevalent among those who live in city slums than among those who are better housed and in more congenial surroundings. It may be that they live in the slums in the first instance due to economic handicaps resulting from mental inadequacy. These reflections should indicate to us that mental hygiene therapy should have a wide application to that segment of our population which is in the care of and under the supervision of our various social welfare agencies.

#### MENTAL HYGIENE AND THE PUBLIC SCHOOLS

As evidenced by the Suffolk report<sup>3</sup> already referred to, mental hygiene has its broadest application in the field of public school work. It is unfortunate that, in some sections of our country and especially in our rural areas, school authorities, school administrators, and all too many teachers have no conception whatsoever of the value of mental hygiene as it relates to school problems which arise almost daily. The lack of knowledge of child psychology on the part of so many grade school teachers is deplorable. Annually hundreds of youngsters, mentally normal, are consigned to a life of frustration and failure because their teachers have no conception of child psychology as it affects the child's behavior and school work. No attention is given to their emotional conflicts, their social handicaps, their

frustrations, their physical disabilities, their nutritional status, their home life, and privations due to economic conditions, etc. It is so much easier for the mentally lazy and ignorant teacher to label the youngster who needs attention a "problem child" than it is to find out and correct the child's difficulties. As a result, hundreds of mentally normal children are consigned to the rubbish heap to increase the army of the anti-social, feeble minded, insane, juvenile delinquents, and other wards of the state, to say nothing of the distress that befalls the families of these children in disrupting home life and rendering other members of the family unfit for normal social adaptation.

Where they have been adequately financed and staffed by competent personnel, the child guidance clinics operated by public health services have proved invaluable to schools which have made use of their services.

#### THE MEDICAL PROFESSION AND MENTAL HYGIENE

The medical profession is awakening to the value of mental therapy. Too many physicians for too long have looked upon the psychiatrists and neurologists as the "nuts" among medical specialists. However, since the revelations as to the prevalence of mental illness as revealed by the selective service examinations, and the incidence of the condition in the armed services, the attention of doctors as well as laymen has become centered upon this field in medicine, and it now looms large on the medical horizon. The doctor has begun to realize that all too often he has treated the husband for stomach ulcer when the trouble was due to the wife being a poor cook.

One who has read the book of Dr. Alvarez, *Nervous Indigestion*, cannot escape the idea that all too many people are treated by drug or surgical therapy, without relief, who should



have had mental therapy. It is estimated by those who have made a study of the subject that 50 per cent of all patients seen by physicians are in need of psychiatric advice. Some authorities place it as high as 90 per cent. That the medical profession is awakening to the significance of mental illness and the value of mental therapy is indicated by the number of psychiatric discussions which have recently appeared in the *Journal of the American Medical Association*. One could easily have mistaken a recent issue for a journal of psychiatry. Physicians are availing themselves of the services of mental hygiene clinics where they have been established and the clinics in turn are using the services of the physicians to the mutual benefit of both parties.

#### PARENTS AND MENTAL HYGIENE

The problem of reaching the parents of children who are in need of mental hygiene therapy presents the most baffling difficulty of the whole program, and yet if real success is to be attained this approach must be made. The Parent Teacher Association offers only one approach. Others will have to be made through the school, the clinic, by lectures, personal contact through social workers, the family physician, or the public health nurse. To say that this part of the program is important is trite. The abysmal ignorance of child psychology on the part of parents is tragic. It is not unreasonable to believe that more children are handicapped by the ignorance of parents in this regard than from any other one cause. The remarkable thing is that so many children escape in spite of the parental handicap. This is too large a subject to enter into here; but permits the recital of a few illustrative cases.

A father had as a teacher when in grade school a man who later taught his children. The teacher used the proverbial rod on the father, which resulted

in a permanent dislike of the teacher. This dislike was often expressed by the father in the presence of his children when some of them were in this teacher's room in school. As a result, when one of his boys reached the grade in school taught by this teacher, the child remained in the grade for two years without passing in a single subject. Fortunately after the second year the principal promoted him to the next grade and he left this teacher's room. He then passed all higher grades through the high school as he had done in those below that of the teacher mentioned. He is now a gunner on a destroyer in the United States Navy. This is a case in which a disparaging remark, probably innocently made, so impressed the elastic mind of the child that he lost a year in school and for this loss the teacher was blamed when, as a matter of fact, it was the fault of the parent. This case illustrates two things: first, how a parent can influence the mind of the child and second, how subtle that influence is.

Another is the case of a mentally bright 8 year old girl whose parents were well-to-do. She was an only child and was being reared according to "Holt." She had developed a "tick" and the family physician had advised that she be taken from school because of St. Vitus's dance. The parents described her as "nervous." Drug therapy had been of no value. She was becoming worse. A complete physical and neurological examination was entirely negative except for the tick, which was an exaggerated muscular movement of the eyes, head, neck, and arms.

Upon inquiring into her home life it was discovered that she had not only been brought up on the "book" but she was also being subjected to a strict regimen as to sleeping, eating, and social activities. A wide discrepancy existed between what she was permitted to do, and her associates of her eco-

nomic and social level. Very positive advice was given to the parents to return her to school, remove restrictions as to articles of diet and eating habits, sleeping hours, and social activities. The advice was given in the presence of the child. It was suggested that she be allowed to "run the house." While these suggestions were being made the happy expression on the face of the child contrasted with the distressful look of the parents; however they consented to try. The results were happy beyond our fondest expectations. When relieved of her frustrations the whole syndrome vanished.

In another well-to-do family of excellent social position a son had red, bushy, unruly hair, and in early childhood his face was heavily sprinkled with deeply pigmented rust colored freckles. For a time both parents, as well as the other children who are brunettes, teased him about his unruly hair, its color, and his freckles. Being a visitor in the home, this was noticed by the author over a period of four or five years. One day the father casually remarked that the youngster at the age of 8 was becoming belligerent, disobedient, and incorrigible, to the dismay of the parents. They feared the child would become a delinquent unless something could be done about the situation.

It was pointed out to him that probably the parents and the other children were responsible for the child's behavior. It was suggested that a change of attitude be assumed and that, instead of emphasizing the undesirable differences in the physical features in this child as compared with the other children, they begin diplomatically and not too obviously to stress the distinction of having red hair (his mother's hair was auburn) and freckles, and indicate that they are often associated with a robust, manly physique and aggressiveness in a young man, and

other desirable manly qualities. This advice was given about four years ago. Last summer when four Boy Scout troops appeared before a local service club to put on a program, this youngster had been chosen by the scout master to act as master of ceremonies in charge of the entertainment. His freckles were less noticeable, his unruly hair was under control, and he looked magnificent in his Boy Scout dress uniform.

#### CHILDREN HAVE CRITICAL PERIODS IN EARLY LIFE

One might cite dozens of cases showing how subtle parental influences and home life are. Innocent remarks playfully made may do irreparable damage to the plastic mind and immature personality of the child in the impressionable years of early life. In making their social adjustments in first entering school, children are often severely handicapped by parental admonitions as to how they shall behave under school and playground situations. The "little man" idea of a doting mother may be the cause of her little idol being dubbed a "sissy" when he comes up against the rough and tumble of the playground, whereas if left to his own devices he may establish himself as a hero among his fellows. His reaction to the situation may make or break him.

#### ECONOMIC ASPECTS OF MENTAL HYGIENE

All of the groups and agencies mentioned need the services which are available through a mental hygiene program, but it has a broad application to the larger aspects of human welfare and associated economic problems, although not more important than those already mentioned.

The cost of the care of those who become public charges is a big item in governmental expenses. It is estimated that crime costs us annually 15

billion dollars, to say nothing of the losses due to theft, embezzlement, fraud, and similar practices. In the matter of curbing or abatement of juvenile delinquency millions of dollars can be saved, to say nothing of saving the youngsters from a life of crime. Experience has shown that mental hygiene clinics have enabled the handling and training of 50 per cent of the feeble minded cases referred to them without sending patients to an institution for care and protection. Every case so treated means a saving of about \$7,000. In addition it saves the individual from the stigma of the insane asylum or feeble minded school.

It is estimated that one child in every twenty is destined to spend a part of its life in a mental hospital. In a child guidance clinic 25 to 30 per cent of those presenting a problem can be eliminated and another 33 to 50 per cent can be greatly improved. In one state a child guidance clinic in a health department, on a budget of \$30,000 saved the state \$140,000, annually. In another state it is estimated that, of the patients treated, 15 to 20 per cent would have gone to a state hospital and would have cost the state \$583,440 annually. In the same state if the program were state-wide it would effect a saving of \$284,452 if only 15 per cent of the institutional cases could be paroled to the clinic.

#### INCIDENCE AND COST OF MENTAL ILLNESS

For each insane person in our institutions there are ten mentally inadequate outside, or six million. Strecher estimates that one-half of all mental

disease is preventable by the application of our present knowledge of mental hygiene, which would mean a saving of as much as \$387,500,000.

Our state hospitals alone cost annually \$210,000,000, and for prevention we spend less than \$3,000,000. Mental cases from World War I have cost us to date over one billion dollars. Each case from the present war will cost from \$30,000 to \$35,000.

#### CONCLUSION

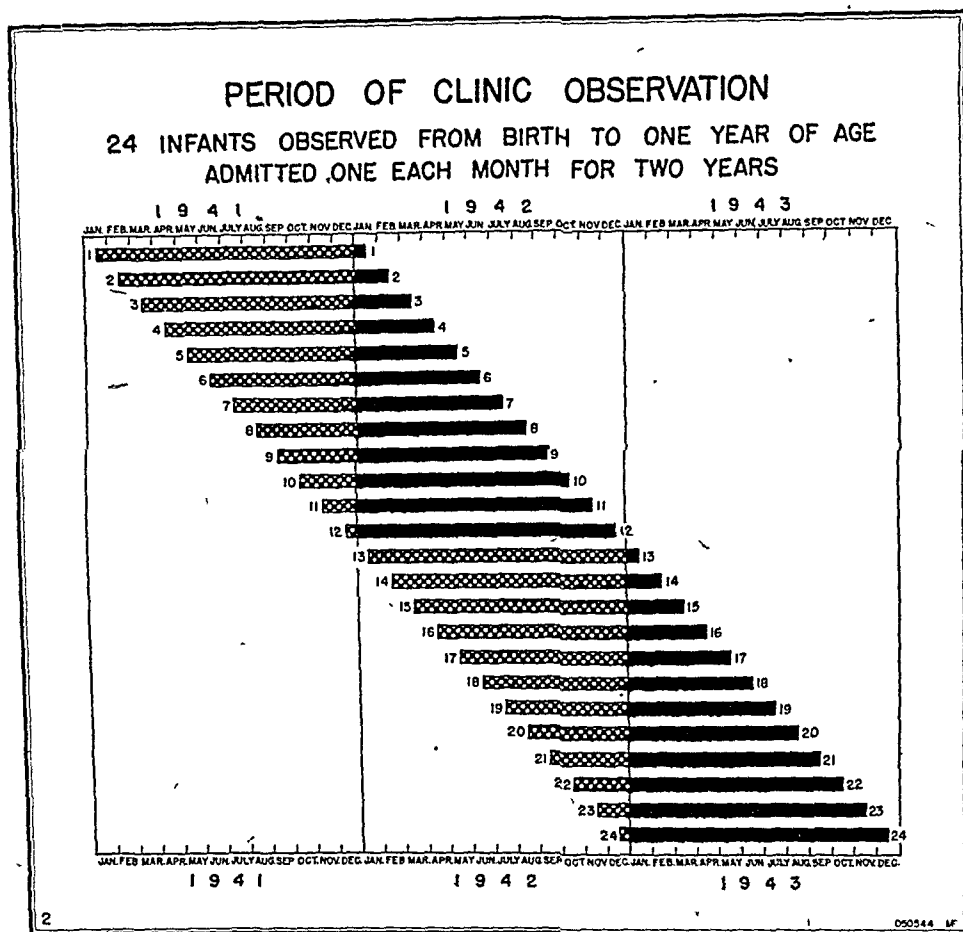
Dr. Menninger<sup>5</sup> says: "It is no mere figure of speech to say we are experiencing a world-wide psychosis. It should arrest the interest of all organized medicine. It should demand our attention to direct an attack on the causes and take immediate measures for treatment and prevention."

Does not a mental hygiene clinic in every public health department on both a state and county level offer the most hope for a solution of the problem of mental illness?

#### BIBLIOGRAPHY

- Amick, Andrew J. Growing Children—Our Responsibility. *West Virginia M. J.*, July, 1944.
- Haugen, Gerhard B. An Approach to the Public Health Mental Hygiene Problem. *Pub. Health Rep.*, 58:32 (Aug.), 1943.
- Jackson, J. Allen. An Approach to a Rural Mental Health Problem. *Pub. Health Rep.*, 52:49 (Dec.), 1937.
- Lewis, N. D. *A Short History of Psychiatric Achievement*. Norton, 1941.
- Lott, George McClelland. Mental Hygiene Services in Rural Areas. *Pub. Health Rep.*, 57:31 (July 31), 1942.
- Menninger, William C. *J.A.M.A.*, 125:16 (Aug. 19), 1944.
- Vogel, Victor H. Mental Hygiene in the State Health Department. *Pub. Health Rep.*, 56 (Jan.), 1941.
- Our Inadequate Treatment of the Mentally Ill as Compared with the Treatment of Other Sick People. *Pub. Health Rep.*, 56 (Oct.), 1941.
- Administrative Organization for Mental Hygiene. *Pub. Health Rep.*, 57:15 (Apr.), 1942.

CHART 2



count of "brand new" is made, the figures are not directly obtainable from the federal reports.

The error which may result from the use of the incorrect ratio is illustrated in a report of infants admitted to nursing service published by the Children's Bureau,<sup>3</sup> which listed one state as having a rate of 117.6 admissions per 100 births. This was explained as "an apparent error in reporting admissions" but the basic error is the comparison of total admissions, drawn from 2 years' births, to the birth figures for 1 year.

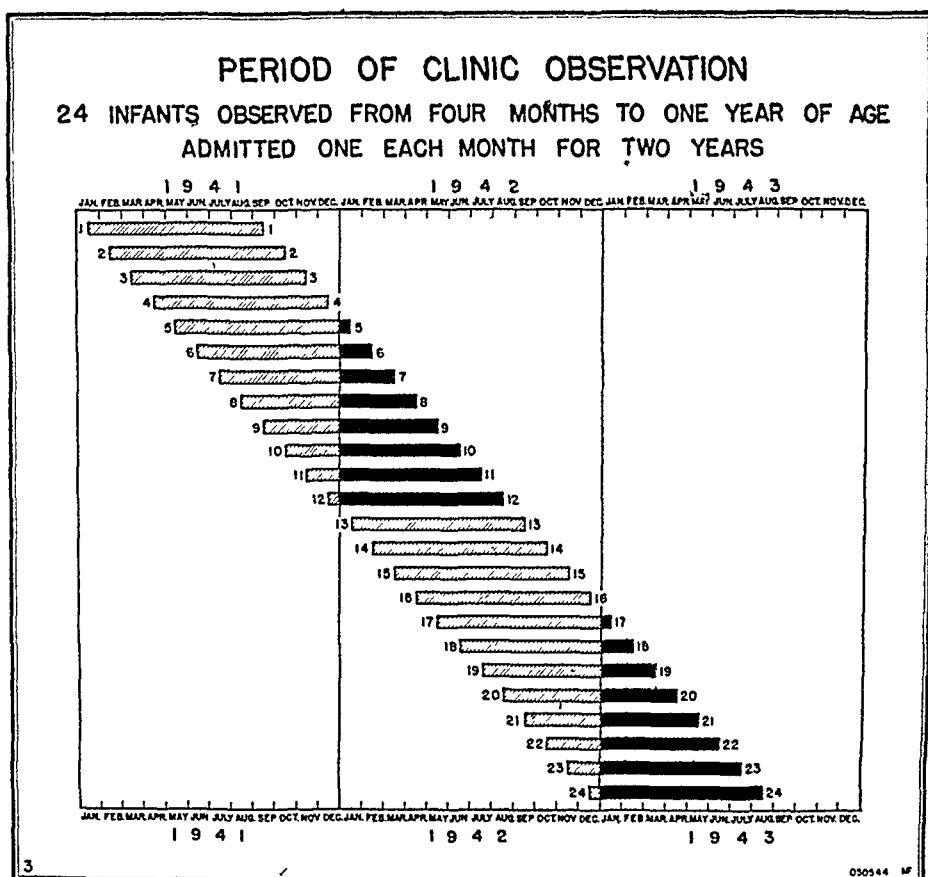
Another instance is the tabulation of "per cent of infants under medical supervision" reported in *Health Practice Indices*.<sup>1</sup> The directions for computing these indices allow the percentage

to be obtained by dividing the total number of infants who were under supervision during the first year of life by the reported births during that year. This must result in overstatement, and casts doubt on the high figures from some communities.

A study of Chart 2 raises the possibility that the number of "brand news" might be estimated at 50 per cent of the total admissions. This chart, however, illustrates an extreme since the average period during which an infant is under observation is usually far less than 12 months.

In a sample of clinic cases to be discussed later, the average period of observation in the clinic during infancy was approximately 8 months. This affects the ratio of "brand news" to total

CHART 3



admissions as shown in Chart 3, which is drawn on the same basis as Chart 2 except that the length of the bar represents 8 months instead of 12 months. One child is still admitted to clinic each month. There are therefore still 12 brand new cases during the calendar year. The total cases seen, however, are only 20, since the shorter duration of clinic observation has allowed only 8 to be carried over from the previous year. Thus the ratio of brand new to total infants seen becomes 12 to 20, or 60 per cent, instead of 12 to 24, or 50 per cent.

There appear to be three factors influencing the ratio of brand new to total infants seen:

1. The mean age at admission.
2. The mean age at termination. Some

children will drop out before reaching their first birthday, although all others will be terminated automatically at 1 year when they are classified as preschool. As the period of observation (i.e., the difference between mean ages of admission and termination) becomes shorter, the ratio of "brand news" to total infants seen becomes greater.

3. The relation between "brand news" and terminations. A new clinic in a hitherto untapped area, where the registration is increasing rapidly, will have a far higher proportion of "brand news" than one in an area from which there is a steady exodus of population and a consequent decreasing clinic population.

It appears that the ratio of "brand news" to total infants seen may have practical usefulness as a supervisory index of the activities of the clinic but all of the implications are not clear at present. In practice the proportion

brand new seems to be relatively stable in a large area. For a number of years New York City, like many other communities, has kept a separate count of these two categories—"brand new cases" and "total infants seen"—and it has thus been possible to study the actual experience in this regard. Chart 4 shows the figures and the ratio of brand new to total infants seen for two clinics in the Borough of Manhattan, one at Kips Bay and one in East Harlem, for 3 successive years. It will be seen that while the range of variation is not too great, the figures do change. If it were impossible to make a separate count of "brand news" a figure of approximately two-thirds of the total infants admitted would not be too far wrong, at least for New York City. This figure may not be the same in all communities nor is it necessarily stable. Even in New York City, exact counts must be made for any detailed analysis or year-to-year comparison.

A method of estimating the number of brand new cases from quarterly reports of total admissions has been suggested by the Children's Bureau.<sup>3</sup> It is based on the fact that most first visits of cases originally admitted the previous year take place during the first quarter of the year. For any year, the number of previous year carryovers may be estimated by subtracting the average of the number of admissions in the fourth quarter of the previous year and the second quarter of the current year

from the admissions in the first quarter of the current year. This approximation is valid, of course, only if clinic populations are stable.

The foregoing discussion leads to this conclusion: To measure the completeness with which potential candidates are brought under the care of the infant health clinic the index must be the ratio of the number of brand new infants seen during any period to births registered in the community during the same period, or to that portion of the births believed to be potential clinic material. Clinic reports should therefore include a count of such "brand news," preferably as a routine.

It is beyond the scope of this paper to discuss standards for proportion of children served since they will vary from one community to another. Many factors are involved, including the social and economic composition of the population served and the availability of service from other sources.

The second question proposed at the outset was that of evaluating how much service is given to a child. It may be wise to point out again that the total quantity of service does not necessarily bear a relationship to the quality and that any conclusions are limited accordingly. Line E-3 of the Tabulation of Health Department Services and corresponding figures in other summaries give the total number of clinic visits. It would seem important to know the average number of visits per child. If total visits were divided by

CHART 4

*Ratio of Brand New Cases to Total Infants Seen**East 69th Street and East 101st Street Clinics, N. Y. C., 1940-1942*

	<i>East 69th Street</i>			<i>East 101st Street</i>		
	1940	1941	1942	1940	1941	1942
Brand new cases	521	497	433	307	401	332
Previous year cases	211	263	234	119	165	228
Total infants seen	732	760	667	426	566	560
Ratio—Brand new cases: total infants seen	.71	.65	.65	.72	.71	.59

total admissions, the result would be only the number of visits made during the calendar year per child seen. In no sense does it tell how many visits are made during the child's first year of life.

In assessing the degree of approach to any set standard of visits per infant, one may attempt to answer one or both of the following questions: first, what, on the average, was the number of visits per child's first year of life, regardless of the length of time he was officially registered under clinic supervision; second, *at what rate*, during the period of time between clinic admission and termination, was the average child attending clinic? An answer to the first question tells how many times infants were seen during their first year and can be set against an arbitrary standard. If the second question could be answered it would indicate whether or not infants are being seen at the desired rate even though they may not be registered early enough or held under clinic supervision sufficiently long to give complete standard service for the first year of life.

To examine the relation between the actual experience and the summary clinic reports, a study was made of a sample of records from the Child Health Station in the Kips Bay-Yorkville Health Center in New York. Records were selected by extracting from the appointment sheets for every other day throughout the calendar year 1942 names of all the infants who registered as brand new during this year. Date of birth, date of admission to clinic, number of visits made in each of the calendar years 1942 and 1943, and date of termination were tabulated.

The results, based on records for 202 children, demonstrate (Chart 5) that during the first year of their lives they made a total of 1,165 visits. Of these, 894 were made during the calendar year in which the child registered (1942) and 271 during the succeeding year

(1943). The 271 visits were made by 128 children who carried over into the following year. If the clinic registration remained constant, approximately the same situation should have existed in 1942 for cases carried over, that is, about 271 visits would have been made by children originally registered in 1941. This would mean that the ratio of the total number of visits recorded for all infants during a calendar year to the number of brand new cases actually admitted that year, approximates the average number of visits per infant during his first year of life.

Thus, by counting the total number of visits during 1942 and dividing by the actual number of brand new children, the mean number of visits per child during infancy may be estimated. The routine clinic summary for 1942 records 433 brand new infants and 2,671 total infant visits, a ratio of 6.2, while in the sample under discussion (Chart 5), the average number of visits was 5.8.

The goal set in New York City is 9 visits per child and it would appear, therefore, that the result is considerably short of the objective. However, as was pointed out above, this average does not take into account the lateness of registration or the time of termination. This particular group was actually under observation an average of not quite 8 months per child. Thus, during the period of observation the children were visiting at a rate of 9 visits during the year. This might be interpreted as meaning that the staff of the station were achieving their objectives as far as supervision of children while under observation is concerned, but that there is room for improvement in fostering earlier registration or preventing terminations or both. It seems obvious that in interpreting the significance of the mean number of visits per child, it is desirable to consider the length of the period of observation.

## CHART 5

## 1,165 Visits to Clinic

Made by 202 Infants Admitted as Brand New in 1942

East 69th Street Clinic, N. Y. C.

	1942		1943	
	Infants	Visits	Infants	Visits
Brand new cases	202	894		
Infants carried over to next year (previous year cases)	128	271	128	271
Total	330	1,165		

However, no simple way has yet been devised of tabulating on daily report forms the necessary data for estimating this period.

## SUMMARY AND CONCLUSIONS

- Two indices which may be used as measures of accomplishment may be readily obtained from routine summaries of clinic service:
  - The proportion of potential infant cases which is being given service.
  - The average number of visits the cases under care are making during the first year of their lives.
- The proportion of the potential case load served may be obtained by deriving the ratio of "brand new" infants to births registered in the community.
- An estimate of the average number of clinic

visits during the first year of life may be obtained by deriving the ratio of total visits of infants to the number of "brand new" infants.

- It is suggested that a separate count of "brand new" infants is essential in addition to the count of total infant visits presently required on the U. S. Public Health Service and Children's Bureau summary forms.

## REFERENCES

- Health Practice Indices*, American Public Health Association, New York, 1943, 116 pp.
- Tabulation of Health Department Services*. Revised Instructions. Approved by the State and Territorial Health Officers, United States Public Health Service, and the United States Children's Bureau, 1940, 22 pp., mimeo. (See also *Pub. Health Rep.*, 51:1236, Sept. 4, 1936.)
- Services of State Health Departments for Mothers and Children, 1940. *Social Statistics Supplement No. 1, The Child*. Vol. 6 (Sept.), 1941, 18 pp.

---

## "Eye Bank"

Formation of The Eye Bank for Sight Restoration, Inc., which will collect and preserve healthy corneal tissue from human eyes for transplanting to blind persons who have lost their sight because of corneal defects, has been announced. The organization, national in scope, has been incorporated under the laws of New York State and 22 leading hospitals in New York City are now affiliated with it; in addi-

tion, 20 outstanding ophthalmologists throughout the country will serve in an advisory capacity. Headquarters are at 210 East 64th Street, New York, N. Y.

Officers elected recently are Stanley Resor, *President*; Dr. R. Townley Paton, *Vice-President*; Cyril B. Hartman, *Secretary*; Walter C. Baker, *Treasurer*; and Mrs. Henry Breckinridge, *Executive Director*.



# Industrial Waste Treatment and Control\*

LORING F. OEMING

*Sanitary Engineer, Michigan Stream Control Commission, Lansing, Mich.*

THE disposal of industrial process wastes creates a wide variety of problems involving one of our most valuable natural resources, namely, water. Uncontrolled waste discharges have the capacity of substantially impairing and often destroying natural stream values. Correction of abuses in waste disposal is the prerequisite to the most constructive use and maximum development of surface waters. It is not surprising, therefore, that industrial waste treatment occupies a key place in water policy administration.

The many sources of industrial waste problems and the conflicts and injuries which they encompass are presumed to be known to the sanitary engineer and industrial hygienist. However, there exists a broader basis than this for a mutual interest in the subject by the two professions. The industrial hygiene engineer will frequently encounter problems involving waste disposal in his industrial contacts. Plants utilizing oil, acid, cyanide and caustic compounds present both occupational and pollution hazards. His knowledge of production practices gained in conducting surveys of industry can be valuable when relayed to the sanitary engineer engaged in obtaining improved waste disposal.

Adoption of control measures by industry to meet the requirements of

either of these groups occasionally raises a problem requiring attention of the other. For example, the installation of wet processes for elimination of dust in foundries makes it necessary for the sanitary engineer to require sedimentation of the water vehicle in order to prevent sewer blocking and filling of stream channels. Conversely, the industrial hygiene engineer will be concerned with the disposal of hydrocyanic acid gas produced by the cyanide waste treatment method described later in this discussion. Control programs in both fields of endeavor can be advanced, therefore, by closer coöperation and wider exchange of knowledge and experience.

After nearly three years of war, it is needless to recount in detail its effects on our control programs. Experiences in control of stream pollution have doubtless been duplicated in obtaining control of occupational hazards. Accelerated production tempo has intensified and accentuated many pre-war problems. Newly established war industry has created additional ones. The means for solving the problems in many instances have not been available due to labor and material shortages and construction restrictions imposed during this period.

Some experiences in Michigan with industrial pollution and control measures applied in specific instances during this period may prove helpful in solving problems elsewhere, both in the present and post-war periods.

The chemical industry in Michigan

---

\* Presented at a Joint Session of the Engineering and Industrial Hygiene Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

uses the state's extensive brine resources as a basic raw material in the manufacture of a diversity of products. After processing for the extraction of the desired chemical components, the brine becomes a waste product. Its principal constituents are the chlorides of calcium, sodium, and magnesium with concentrations in excess of 200,000 p.p.m. as Cl.

The problems arising out of its disposal to streams are manifold. It imposes artificial hardness upon public waste supplies which cannot be removed by softening processes. Increased costs of boiler operation and corrosion of plumbing arise when chloride concentrations exceed 100 p.p.m. Fresh water fish apparently resist varying concentration without injury up to 4,000 p.p.m.<sup>1</sup>

Limited quantities of waste brine have been injected into underground formations through abandoned production wells or especially drilled disposal wells where a sufficiently porous stratum can be found. Use for dust laying on county roads has also been practised to some extent. But the greater portion still finds its way into the streams. Impounding and controlled discharge during periods of high stream flows represents the most effective means of minimizing brine pollution at present.

Erection of plants by the Defense Plant Corporation at Ludington and Marysville, Mich., for extracting and processing magnesium created two additional wartime sources of chemical waste having origin in brine. The control measures evolved were designed to furnish the maximum of protection to established water supply, commercial fishing, and recreational interests.

At Ludington, the waste brine is pumped through 12 miles of 14" diameter steel pipe line to an isolated region along the Lake Michigan shore. The point of discharge into the lake is some 600' from the shore in 16' of

water. During slightly over a year's operation of the plant, five surveys have been made of the area by means of a conductivity cell to observe the behavior of the wastes. Contrary to expectations, the brine did not diffuse. However, location of the outlet did provide protection originally contemplated. The brine, having a specific gravity of 1.18, remains on the lake bottom in approximately its original concentration. Flow of the brine stream in a southerly direction is induced by a slight lake current which is not influenced by wind and wave action. The brine layer has a thickness of from 1' to 3' and the total area covered accounts for 85 per cent of the total volume discharged.

Extraction of magnesium at Marysville by electrolysis of the magnesium chloride produced at Ludington results in the formation of large volumes of hydrochloric acid wastes. These are discharged to the St. Clair River through a submerged multiple outlet pipe designed for the reaction of acid with sufficient river water to effect neutralization in the minimum space of time. The quantity of river flow required for this purpose represents a small part of the entire 200,000 cu. ft. per second of river discharge.

Failure of the system to prevent pollution injury resulted from the substitution of vitrified clay for rubber lined steel pipe during construction. Breaks in the diffusion line have developed from time to time. The unequal distribution of wastes created zones of high acid concentration. Fish continually came to the surface in a stupified condition, furnishing a sumptuous feast for flocks of gulls and terns. However, on the few occasions when the line was in good repair, satisfactory results were obtained and no fish distress was evident. Sufficient protection was provided for downstream water supplies at all times. Replacement of the distribution line

scheduled for late 1944 has been postponed by the recent closing of the plant.

Phenolic type wastes are objectionable by reason of the taste and odor imparted to the receiving water. Public water supply developed from sources containing as little as 1 part in 1,000 million parts of water when chlorinated generally becomes unpalatable to the consumer.<sup>2</sup> The flesh of fish caught in waters subject to this type of pollution exhibits taint which renders it inedible. In Michigan, the tainting effects have constituted an economic loss to the commercial fishing industry as well as injury to sports fishing interests.

An outstanding record in the treatment of phenolic wastes has been made by the Dow Chemical Company at Midland, Mich. In 1937, a treatment plant was constructed with provisions for clarification and filtration through blast furnace slag. In 1940, two additional filters duplicating the initial installation were placed in operation to provide treatment for new sources and increased volumes of waste. Further enlargement of the facilities became necessary in 1942 under accelerated wartime production. WPB approval, predicated upon downstream water supply protection, was obtained for supplemental treatment of the filtered wastes by the activated sludge process. Since completion of the additions in the spring of 1943, removals of 4,500 pounds of phenol per day from an average 15 million gallons daily waste flow have been obtained. Notwithstanding this performance, water supply and commercial fishing interests continue to suffer from this phenol and other organic residues.

An additional war-connected problem has arisen out of the manufacture of synthetic rubber. Thiokol wastes have extremely high oxygen demand and caustic alkalinity. Experimental treatment on a semi-plant scale by

aeration, using diffused air coupled with recirculation of sludge, has met with some success.

The cracking of alcohol to styrene, an ingredient of Buna S rubber, produces wastes which are odor-producing and toxic to fish life. Evaluation of the pollutant characteristics with respect to fishes has been made by the Institute for Fisheries Research at Ann Arbor, Mich.<sup>3</sup>

The polymerization of butadiene and styrene to produce Buna S in a plant on the St. Clair River has been traced as the source of an odor problem in the water supply of the City of Detroit. Treatment and control methods await the outcome of research now under way.

Wastes containing acid and cyanide from metal working and plating industries often are the cause of wholesale fish destruction. When discharged to municipal sewage plants, they frequently disrupt and seriously impair the sewage treatment function.

Dumping of the contents of vats when the sulfuric acid concentration is between 3 and 4 per cent is common in metal pickling practice. Neutralization with lime and recovery of acid or by-product copperas are among the control methods available.

Cyanide wastes are a constant threat to animal and aquatic life. Cattle killings have occurred where stock had access to cyanide-bearing streams. Fish life is completely snuffed out at concentrations above 0.5 p.p.m. of CN.

Ash residue from the molten cyanide used in case hardening has contributed toxic concentrations of CN to streams by way of surface drainage through dumping grounds.

Impounding of the wastes has long been demonstrated as an inadequate method of control. Removal of cyanide from solution as hydrocyanic acid gas by decomposition with sulfuric acid has been practised successfully for a num-

ber of years at Chevrolet Motor Company's plant in Flint, Mich. This method has also been included in the treatment facilities provided by the Ford Motor Company, at its Willow Run bomber plant. It will interest the industrial hygiene engineer to know that the hydrogen cyanide hazard is prevented by blowing the gas through a vent stack some 40' high.

Research by the DuPont de Nemours Company has recently developed a process for converting cyanide to non-toxic cyanate by the reaction with sulfur compounds. The method is not applicable where the treated wastes enter sewage plants using chlorine for sewage disinfection. Chlorine reverses the reaction and restores toxic properties.

Chromium compounds are notable for the yellow color imparted to streams and their germicidal effect upon organisms essential to sewage sludge digestion and natural stream purification. Much of the development in treatment methods must be credited to the research program conducted by the State Water Commission of Connecticut.

At the Ford Motor Company's Willow Run plant removal of chromium is accomplished by application of ferrous sulfate to reduce the hexavalent chromium to trivalent form. Neutralization with lime then precipitates chromium hydroxide as sludge which is placed in a lagoon.

Oil wastes are common to both metal working and oil refining industries. Rapidly changing production, brought about by the war, intensified the oil waste problem in many of our automotive plants.

In addition to its detrimental effect on fish and wild life and its nuisance value, oil discharged to streams is a waste of a war-vital resource. In aggravated conditions, such as at Flint since the war, the surface of the river

becomes ignited, imperiling riverside buildings, bridges, water supply impounding dams, and other property.

Devices which have been installed for oil and water separation vary widely in design and effectiveness. Separators embodying the features of design developed by the American Petroleum Institute for refinery application have proved successful in the forging industry as well. Adequate operation and maintenance is of prime importance in the performance of any of the separating devices.

With few exceptions, the accomplishments in control of pollution from the paper industry have been limited to recovery of fiber and re-use of waste waters. Experience has demonstrated the feasibility of reducing fiber losses to 1 per cent of paper production and waste flows to 20,000 gal. per ton of product at a financial advantage to the mill. However, as a means of waste control, the benefits derived are offset in considerable measure by opening up closed systems for discharge of wastes during periodic mill cleanups and changes in grade and color of product.

In many instances, satisfactory stream conditions cannot be maintained by internal mill improvements alone. Treatment by settling with or without the aid of chemical precipitation then becomes necessary.

Settling of board mill wastes preceded by flocculation with alum has produced an effluent with suspended solids content and turbidity below that of the river at the Monroe Paper Products Co. mill. Clarification of the paper machine wastes in a mill using higher grade pulp has been obtained by floatation methods at the Sutherland Paper Company in Kalamazoo. A high grade quality of effluent is being produced at a lower cost for structures than would be expended for conventional flocculation and settling units to accomplish the same result. Re-use of

the clarified waste conserves dwindling ground water resources in the area. Its operation appears to hold promise of extended application in the post-war period.

Mill effluents containing de-inked and straw pulp wastes provide ample opportunity for improved disposal practice. Development of methods for reducing their oxygen demand and solids concentrations entails further research.

Treatment and disposal of spent liquors from sulfate and sulfite pulping processes presents serious technical and financial problems for the industry. The so-called sulfate black liquors are generally processed for recovery of chemical components. However, varying quantities of weak liquor enter the mill wastes and produce objectionable taint in fish. Fractional precipitation of sulfite liquors for by-product recovery by the Howard Process is reported as successful at the Marathon Paper Company's mill, Rothschild, Wis. Production of ethyl alcohol from sulfite liquor appears to offer little hope of reduction in stream pollution since it is reported that the waste problem is only modified, not eliminated.<sup>4</sup>

A research program covering all aspects of waste problems in the pulp and paper industry is now being formulated on a national scale by the National Council for Stream Improvement under sponsorship of the industry. Its progress, findings, and conclusions will be awaited with utmost interest by pollution control authorities.

The policy expressed at a regional meeting of the Council in Chicago recently gives encouragement that the stalemate in the industry can presently come to an end, and by the same token presents a real challenge to the industry.

After practical methods of disposal are developed, however, there still remains the question whether management will accept the benefits of scien-

tific investigations and proceed without further delay in bringing the wastes under control.

Wastes produced by the wartime development of food dehydration have caused acute injury and obnoxious odor nuisances in some localities. Potato dehydration wastes have been particularly serious offenders in Michigan. The principal polluting constituents are skins, trimmings, and starch losses resulting from the preparation of the potato for processing. Control has been supplied in one instance by segregation of the concentrated lye peeling and starch washer wastes for treatment at a municipal sewage plant. The balance of the wastes is sufficiently improved by fine screening and plain sedimentation to permit its discharge to the water course. Disposal by seepage and evaporation is practicable in some climates, but in our state treatment methods must be found.

The utilization of beet sugar processing equipment in dehydrating potatoes for cattle food under contract with the Commodity Credit Corporation during recent months has increased the scope of the waste problems in this industry. The industry unfortunately failed to recognize the pollution potentialities of these wastes and did not make provision for their treatment. The attention of federal agencies involved in the contractual arrangements has been directed to the problem and efforts are being made to avoid recurrence of past conditions through study and research.

The possibilities of by-product recovery for pollution control were recently demonstrated at a dextrose plant operated by the Doughnut Corporation of America at Holland, Mich. Conversion of high protein flour to dextrose was accompanied by the wasting of some 4 tons of protein daily to a highly developed resort lake. Recovery of the protein for meat extender and manufacture of monosodium glutamate has

eliminated 95 per cent of the pollution load. Expensive treatment was avoided and recovery has become an essential part of the operating economy.

In addition to the foregoing, methods are available for handling many of the wastes from other industry. The *Industrial Waste Guides* prepared by the Public Health Service in connection with the Ohio River Pollution Survey present an authoritative compilation of current treatment and disposal practices in existence today. The solution of many remaining problems awaits the completion of experimental and research programs now under way. However, with all the present knowledge plus developments promised, a strong state agency with adequate personnel is needed to obtain conformance with the law. It has been repeatedly found

that failure to adhere to specifications in the installation of approved treatment processes results in 'disillusionment' for polluter and injured interest alike. From our experience it will still be necessary to continue investigations, and inspect and supervise the installation and operation of treatment plants if our water resources are to be adequately protected.

#### REFERENCES

1. Hubbs, Carl L., and Washburn, George N. *Report No. 863*. Institute of Fisheries Research—The Toxicity of Michigan Oil-Well Brines to Fishes. Apr. 19, 1943.
2. Public Health Service Drinking Water Standards. *Pub. Health Rep.*, 58, 3:69-111 (Jan. 15), 1943.
3. Hubbs, Carl L., and Washburn, George N. *Report No. 810-A*. Institute for Fisheries Research. Toxicity Tests on Wastes from the Styrene Process. Jan. 5, 1943.
4. Hanson, Fred S. Ethyl Alcohol from Sulphite Waste Liquor. *Paper Trade J.*, Dec. 10, 1942.

---

## Engineers and Sanitarians in Local Health Service

*Local Health Units for the Nation*, soon to be published as the report of the Association's Committee on Local Health Units says "a reorientation in the field of environmental sanitation and a clarification of objectives under professional leadership would result in better sanitary work with fewer workers of non-professional grade and at less cost than at present."

In making its study of existing local health services and its planning for complete coverage of the nation by at least a minimum of such services, the committee found that in 1942 the various full-time and part-time local health departments employed a total of approximately 5,500 workers in the field of environmental sanitation. This represents an average for the United States of approximately one worker per 24,000 population, although many areas had no such service. Of the total not much more than 10 per cent were

reported to be professionally trained.

In order to staff on a minimum basis the 1,200 units through which the committee suggests that local health service can be economically administered in the United States, a total of 5,800 workers is recommended, an increase of only 6 per cent over the number found employed in 1942. Professional personnel, preferably public health or sanitary engineers, however, would be more than tripled by the committee and would represent approximately one-third of all workers, and provide at least one professionally trained worker in each unit. This recommendation is reinforced by the Association's Committee on Post-War Sanitary Engineering Problems, which points out that the maintenance of public health must make use of "engineering health service which utilizes the materials and forces of nature in the adjustment of the environment to man."

# Integrating Nutrition Education and Activities in the School Program\*

MARGARET S. CHANEY, PH.D.

*Professor of Home Economics and Chairman, Department of Home Economics, Connecticut College, New London, Conn.*

NUTRITION education is a means to better living—healthier, happier, and more satisfying living.” This is the opening sentence of a bulletin of the Connecticut State Department of Education, entitled *A Program of Nutrition Education in the Elementary School*,<sup>1</sup> prepared in 1943 by nutritionists and educators in that state.

This concept of nutrition education may raise questions in the minds of some people but should serve as a challenge to those who are responsible, to a great extent, for the success of the school health program in this rapidly progressing era.

There is no need to spend time proving that, despite the fact that this country has the food required to feed its people adequately, nevertheless inadequate diets are quite common. A recent bulletin of the National Research Council, entitled *Inadequate Diets and Nutritional Deficiencies in the United States*,<sup>2</sup> lists studies which show the widespread prevalence of moderately deficient diets and of subacute or chronic states of malnutrition. Those who question the truth of this fact are apt to base their opinion on inconclusive or unreliable data. The weight of a child as compared with standard weight-height-age charts is not now

accepted as a sole means of judging nutrition. Nor is “pep,” which is so frequently due to nervous tension, nor freedom from actual recognizable disease. Too frequently large-scale, insufficiently controlled surveys lead to conclusions actually not proved.

The report of the National Research Council mentioned above discusses the significance of dietary deficiency states during growth and development, and the relationship of diets low in certain nutrients to easy fatigue, irritability, lack of “pep,” poor appetite, and decreased physical and mental efficiency. Of especial interest to those concerned with the teeth are the statements made concerning dental decay. As confusing and complex as this condition is, there are certain conclusions which the writers of this bulletin believe are worthy of emphasis. They say, “There is sufficient work of good caliber to indicate that attention to diet can not only decrease the prevalence of caries, but give some protection against the further development of that already present. Also, it is equally evident that malocclusion, uncleanness, bacteria, too many sweets, and unknown factors are involved in the process.”

The need for nutrition education as a means to healthier living is evident. And as for a happier and more satisfying living, there too nutrition education plays an important rôle. Good health, ability to work, to play, to rebound from fatigue, to recover speedily

\* Presented at a Joint Session of the American School Health Association and the Food and Nutrition and the Dental Health Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

from illness, to resist infection—these make for happiness and satisfaction in life, and these are the logical outcome of an optimal state of nutrition.

But nutrition education *per se* does not necessarily result in better health, more happiness, greater satisfaction in life. It is the job of those who are teachers, whether they be classroom teachers, dentists, nurses, dental hygienists, or parents, to study the problem of how to make nutrition education "take." They must not only know nutrition subject matter and keep up with this ever advancing science, but also must know how to put it across so that it will actually function in the youth's day-by-day living. More to the point than what the child can recite is what he does. Not only should he know the value of green and yellow vegetables, the need of his body for calcium, the importance of sufficient fuel or calories for his body engine, but, more important, he must eat every day a diet sufficient both in quality and in quantity. He must have a wholesome attitude toward food and health habits, an increasingly intelligent understanding of the reasons for these practices, and an awareness of their relation, not only to his own state of being, but also to that of his family, his friends, his community.

There are several reasons why nutrition education may fail to function as it should. Unless the administrator safeguards against these dangers he cannot hope for the success which is so essential. First is the common lack on the part of the teacher of nutrition knowledge; more and more teachers' colleges are including nutrition as one of the required subjects, but too often, still, it is omitted altogether or taught as a unit in a science course by someone who is not trained in nutrition. In-service teachers, especially those who have held certificates for some years, need summer school, evening school, or

correspondence school courses so that they may learn the current facts and the newer methods of teaching them to their pupils.

Second, there is a tendency for nutrition education to be taught in the same manner and at the same level throughout the whole school system, without consideration of the changing needs, interests, and abilities of the children. Plans should be made for different age levels and, although the objectives may be fundamentally the same throughout, the factual content of the course and the activities and experiences included should vary and become increasingly more challenging as the child grows older.

Other factors than age must be considered also. The socio-economic status of the children's families has a significant bearing on nutrition teaching. Economically privileged groups often have greater needs for the development of wholesome attitudes toward food, whereas children from lower income families are apt to need help in actually securing the food which the home may not afford or which may not be supplied there because the mother is working. Nationality must be taken into account, advantages taken of the good food choices and preparations in homes of foreign extraction and consideration made of the effects of certain substitutes which change the excellent diet of the foreign land to a poor one here. The needs of urban and rural children may vary, as well as their interests and experiences. Facilities and equipment are influential factors in nutrition teaching; with simple materials and a little money much can be done to make nutrition teaching function more fully. Thus it may be seen that a stereotyped curriculum may be the reason that this important field of knowledge does not fulfil its utmost potentialities.

A third reason why nutrition education may not accomplish its aim of



greater health, happiness, and satisfaction is its failure to reach into the home. Education in the school, where the child spends only about one-fourth of the hours in the day, must be carried into the home where it is to be put more fully into practice. This objective may be accomplished largely through the activities included in the teaching at school, and by securing the coöperation of the family through Parent-Teacher-Association meetings, and by visits of the parents in the school and of the teachers in the home.

The planning of the nutrition program should be a coöperative project involving the combined efforts of the teachers who will use the curriculum, of nutrition and other science authorities, of education supervisors, the parents, and the children. Unless all of these groups are included there is a chance for failure in the program.

The school is the ideal place for a well planned, up-to-date nutrition program. Its set-up is conducive to learning, to habit formation, and to the performance of activities which are a natural part of nutrition teaching.

The integration of nutrition with other school work is much to be desired. In studying a foreign country, not only the foods produced should be investigated but also the food customs of its people, their physical status and probable dietary problems. A study of the community in which the children live provides opportunities galore in a functioning nutrition program. Some authorities believe that nutrition should not be taught at a set time of the day, or as a special subject. Many nutritionists favor its inclusion as such in the school program because of their belief that otherwise it may be so subordinated that it will be neglected and will fail to function. They have found from experience that children really enjoy the study of the foods they eat in relation to their state of nutrition, and

that geography, art, and arithmetic can be incorporated as easily into a nutrition lesson as it can fit into the other subjects.

The physical facilities and the entire program of the school should favor wholesome living. Good posture should be encouraged at all times and in every conceivable way. Strain and undue fatigue should be prevented. Cleanliness, ventilation, and lighting should be given due consideration. Provisions for adequate medical care, and for frequent dental and physical examinations should be made. A school lunch should be provided for those who need it.

The feeding of the child, primarily a home responsibility, should frequently be taken over in part by the school. The distance of the school from home, the shortness of the noon recess, and the complicated home set-up with the mother away or too involved to prepare and serve an adequate meal to her children—these are all logical and legitimate reasons for the school lunch program. But an equally or even more important reason for the school's taking over the feeding of a meal to children is that this activity offers an excellent medium for nutrition education. Here is an opportunity for learning through experience, with enough repetition so that habits may be formed. The school lunch is also a means of safeguarding the child's health. During the last school year, according to Lee Marshall, Director, Office of Distribution of the War Food Administration,<sup>3</sup> school lunches benefited more than four million children in thirty-one thousand schools. Government funds are again this year available to schools and child care centers, to pay part of the food cost, with equipment, labor, and supervision furnished by the state and by local, or civic organizations. Often private agencies carry the expense and management of the school lunch until enough public opinion is

aroused to provide community funds for the support of this worth while project. Thus indirectly may be the story of nutrition spread through the community.

As in the case of nutrition education as a whole, so with the school lunch program, its success depends upon its sound organization and efficient administration. School officials should back the program to the full; frequently, parents and trained community groups may contribute to its smooth execution. Supervision by a trained home economist is important. She will see that, above all, the children are supplied nourishing, properly prepared food, that the environment is favorable for its utilization, and that nutrition education goes hand in hand with the feeding. Posters on the wall, frequent check-ups on trays, public acknowledgment of wise choices, individual guidance when it seems wise, a really genuine interest in each child—all these help to make the school lunch program one for positive health. The lunch should not be a source of profit and it should be avail-

able without discrimination to all children who do not return home at noon, whether or not they can pay for it. One of the great advantages of the school lunch as a part of a functioning nutrition education program is the ease with which its values penetrate into the home. Finicky eaters and fussy mothers alike become convinced when the group puts its stamp of approval on the meal.

A broad nutrition program is an integral part of the school system, one in which the home and the community also participate, one which meets the current interests and needs of the children so that it will function in the promotion of a healthier, happier, and more satisfying way of life.

#### REFERENCES

1. Connecticut State Department of Education, Division of Instruction, Hartford. A Program of Nutrition Education in the Elementary School. *Bull. XXVII*, Mar., 1943.
2. National Research Council, National Academy of Sciences, Washington, D. C. Inadequate Diets and Nutritional Deficiencies in the United States. *Bull. 109*, Nov., 1943.
3. Marshall, L. 5,000,000 for Lunch. *Consumers' Guide X*, 2 (Aug.), 1944.

---

## Civilian Hospitals Have Million More Patients

An increase of a million in the number of patients admitted to civilian hospitals in this country was reported by Dr. Donald C. Smelzer, President of the American Hospital Association, when announcing May 12 commemoration of National Hospital Day. He reported that civilian hospitals are waging a two front war in a nation requiring their services at home and abroad. Their records shows 54,000 hospital trained nurses and 60,000 hospital trained doctors, many thousands of technicians serving in the armed forces and admission of 12 per cent of the

American population to community hospitals in 1944 for civilian hospital care. Dr. Smelzer said that, despite a drop in the total number of voluntary hospitals, the bed capacity in them had actually grown by several thousands. Shortages of personnel and supplies and the increased demand for hospital care had required patience and understanding from administrators and the communities.

May 12 was observed as the 125th anniversary of the birth of Florence Nightingale, who initiated modern hospital practice.

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35

July, 1945

Number 7

C.-E. A. WINSLOW, DR.P.H., *Editor*  
LEONA BAUMGARTNER, M.D., *Associate Editor*  
ARTHUR P. MILLER, C.E., *Associate Editor*

MARYCK P. RAVENEL, M.D., *Editor Emeritus*  
MARTIN FROBISHER, JR., Sc.D., *Associate Editor*  
JAMES E. PERKINS, M.D., *Associate Editor*

AUGUSTA JAY, *Editorial Associate*

### Editorial Board

REGINALD M. ATWATER, M.D.  
*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.  
KENNETH F. MAXCY, M.D.

HENRY E. MCALEER, M.D.  
ALTON S. POPE, M.D.

C.-E. A. WINSLOW, DR.P.H.

## GAMMA GLOBULIN FOR MEASLES

PROGRESS made in identifying and separating the priceless individual components contained in the human blood stream is one of the most fascinating chapters of recent physiology. The process of blood transfusion dates back to the 17th century; and long before the present war a first step in fractionating the constituents of the "life blood" was taken by the separation of the red cells from the plasma, so that each of these two elements could be preserved for its specific uses. The further analysis of the plasma was initiated by researches sponsored by the Rockefeller Foundation and Harvard University and, since August, 1941, coordinated by the National Research Council and supported by a contract recommended by the Committee on Medical Research between the Office of Scientific Research and Development and Harvard University.

A recent report on this work by E. J. Cohn<sup>1</sup> indicates the splitting of the plasma proteins into more than a dozen specific components. The major fraction (58 per cent) contains the albumens, used for the treatment of shock, hypoproteinemia, and edema. The component in which we, as public health workers, are particularly interested is Fraction II of the gamma globulins; for it is this fraction (including only 5 per cent of the total plasma proteins) which contains the specific immune bodies against measles.

The progress in practical immunization against this disease has passed through three earlier stages, involving, successively, the use of convalescent serum, pooled normal adult serum, and placental extract. Fraction II of the gamma globulins is twenty-five times as potent as plasma in its content of measles immune bodies. It has been shown (Stokes, Maris, and Gellis,<sup>2</sup> Ordman, Jennings, and Janeway<sup>3</sup>) that these gamma globulin antibodies are effective in the prevention or attenuation of measles and that their use "constitutes the safest and most effective agent available for the prophylaxis of measles" (Janeway<sup>4</sup>). It is a source of gratification that this material is now available to local health officers and in many states

has already been placed in their hands. For this happy consummation we owe a debt of gratitude to the American Red Cross which has made its stock of pooled human plasma available, and to the commercial firms which have provided the extracted gamma globulin at cost. Gamma globulin should be particularly valuable in certain New England, Middle Atlantic, and Mountain states, which had a low prevalence in 1944. The South Atlantic and Pacific states had, on the other hand, a rather high prevalence last year.

The injection should be given to the exposed child, preferably, on the fifth day after exposure, which is practically convenient since this is the day when the original source of infection usually develops a rash. At this stage, a dose of 0.02–0.025 ml. per pound of body weight will in most cases produce a mild attack with subsequent active immunity; while a dose of 0.075–0.1 ml. per pound will generally confer complete protection. The former result is, of course, the one at which we should normally aim with a healthy child. Reactions, according to Janeway, occur in less than 2 per cent of children injected and are ordinarily limited to local soreness or swelling and fever. The public health nurse would do well to urge the use of this protective agent in appropriate cases.

It is interesting to speculate on what may happen when the use of this prophylactic against measles becomes general. Since active immunity will be developed only in families where there is a measles case and only in children who receive the ideal minimal dose of globulin, it seems probable that the amount of immunizing material present in pooled human blood will gradually and steadily diminish. Perhaps by that time, the physiological chemist can synthesize the essential globulins. In any case, we can cross that bridge when we come to it. We have an ample supply of gamma globulin, containing immune substances, for 1945–1946. We should use it to the full extent.

#### REFERENCES

1. Cohn, Edwin J. Blood Proteins and Their Therapeutic Value. *Science*, 101, 2612:51–56 (Jan. 19), 1945.
2. Stokes, J., Jr., Maris, E. P., and Gellis, S. S. The Use of Concentrated Normal Human Serum Gamma Globulin (Human Immune Serum Globulin) in the Prophylaxis and Treatment of Measles. *J. Clin. Investigation*, 23:531–540 (July), 1944.
3. Ordman, C. W., Jennings, C. G., Jr., and Janeway, C. A. The Use of Concentrated Normal Human Serum Gamma Globulin (Human Immune Serum Globulin) in the Prevention and Attenuation of Measles. *J. Clin. Investigation*, 23:541 (July), 1944.
4. Janeway, Charles A. Clinical Use of Products of Human Plasma Fractionation. *J.A.M.A.*, 126, 11:674–680 (Nov. 11), 1944.

## SUPERCHLORINATION AND "BREAK-POINT" CHLORINATION

WHEN the process of disinfecting water by the use of chlorine was first introduced at Boonton, N. J., in 1908, the presence of what was assumed to be a safe excess of residual chlorine was determined by tests which did not distinguish between true free chlorine and chlorine combined with nitrogenous compounds in the form of chloramines. It was assumed that residual chlorine estimated in this way was a valid measure of disinfecting power. Since about 1925, however, it has been recognized that much greater amounts of chlorine are necessary in order to remove the odors present in certain supplies, because in that year Sir Alexander Houston utilized high doses of chlorine in London to oxidize taste- and odor-producing compounds, especially phenols. The term

"superchlorination" was used for this procedure because the doses required to remove odors were well in excess of those currently employed for disinfecting purposes.

Superchlorination for taste and odor control was introduced on this continent by Norman Howard and has been used for a number of years at Toronto. The precedent established by Houston and Howard included the practice of dechlorination to remove the high residuals remaining in the treated water following superchlorination; therefore, the influence of this treatment procedure upon conditions in the final distribution system was not studied until later.

The practice of superchlorination for the elimination of tastes incidental to the presence of chlorophenols was utilized chiefly in certain areas where phenol substances from by-product coke ovens were present in the water to be treated. Secondary advantages of superchlorination such as the oxidation of iron, organic matter, etc., for improved coagulation and more especially for improved disinfection secured through the use of higher doses of chlorine, were discussed in technical literature but did not receive serious attention until the late 1930's.

At this time, C. R. Cox of the New York State Department of Health and others pointed out that current dosages of chlorine, utilized in "marginal chlorination," while destroying typical *Escherichia coli*, might not kill related coliforms or other organisms which were potential factors in the causation of gastroenteritis. Researches, conducted largely by the members of the Wallace & Tiernan Company staff, revealed new and important facts in regard to the chemistry of chlorination. These studies showed: (1) that where chlorine was added in progressively increasing amounts to a given water the chlorine residual (as then determined) at first rose in proportion to the amount of chlorine added; (2) that at a certain concentration the addition of further chlorine was accompanied by a sharp decrease in chlorine residual; and (3) that, after reaching a minimum—the "break-point"—chlorine residuals rose with further additions of chlorine. It was discovered that the chlorine residual occurring with a dose below that producing the break-point consisted of chloramines rather than free chlorine and that the decrease apparent at the break-point represented complete oxidation of the amines and other nitrogenous substances. Only beyond the break-point did the residual represent free chlorine which is the really effective disinfecting and deodorizing agent. Ideal results can only be attained when this type of residual is produced. Such chlorination is essentially a scientifically controlled superchlorination. Griffin and Chamberlain<sup>1</sup> have recently presented striking demonstrations of the great improvement attained at typical plants by the use of this procedure. In one instance increase of chlorine from 1.44 p.p.m. to 5.49 p.p.m. diminished the proportion of gas-forming organisms from 43 per cent to 5 per cent. In another case an increase from 1.06 to 2.03 p.p.m. decreased the proportion of gas-formers from 38 per cent to 4 per cent.

It was also found that the chlorine reaction-products, formed when the chlorine doses were less than those required to secure complete oxidation, led to chlorinous tastes, whereas active free residual chlorine such as hypochlorous acid was practically tasteless even when present in relatively high concentrations, although this active free chlorine did produce a slight chlorine odor. This of course established taste and odor control on a sounder basis than previously had existed.

Finally the Laux "flash test" for active free chlorine was developed as a simple means of ascertaining whether residual chlorine was present as hypochlorous acid or its equivalent, or as chloramines or other chlorine reaction-products of

lower oxidation potential and hence lower disinfecting action. The Laux test, however, was only qualitative. Quantitative comparison with the color standards was difficult since the intensity of color occurring immediately after the reagent is added to a sample increases at a rate too rapid to obtain reproducible readings during the first 30 second period. Because of this situation Gilcreas and Hallinan of the New York State Division of Laboratories and Research developed the orthotolidine-arsenite test to distinguish between active chlorine and chloramines. The appropriate use of this test also discloses any false value incidental to the presence of manganese, nitrites or iron.<sup>2, 3</sup> Attention is called to the discussion of this subject in the report of our Committee on Water Supply in this issue of the *Journal*.

As a result of these successive developments water works officials now have at their disposal a treatment process (in use at some 200 plants in the United States) which will aid in the destruction of taste- and odor-producing compounds by oxidation, and which will result in much more effective disinfection. The active chlorine residuals so secured are stable because reducing substances have been previously oxidized. Therefore this procedure makes it possible to maintain free active chlorine residuals throughout a water distribution system after the treatment has been used for a sufficient period to oxidize organic matter coating the inner surfaces of the system. It may take months for this to occur but ultimately some free active residual chlorine can be maintained throughout.

As a result of this situation, more effective control of the bacterial content of water passing through distribution systems is possible than previously was the case. Also, the effectiveness of disinfection by break-point chlorination is such as to result in the elimination of coliform organisms as well as the much more resistant lactose-fermenting anaerobes which otherwise would produce positive presumptive tests when samples of the water are examined. While the elimination of these positive presumptive tests may not have a scientific significance in so far as intrinsic potability of the water is concerned it does furnish a very practical means of controlling disinfection because break-point chlorination can be so supervised as to result in a treated water containing no lactose-fermenting organisms. This of course eliminates the necessity of confirming numerous positive presumptive tests, and hence simplifies bacteriological control.

No advance in this imperfect world is without its hazards and uncertainties. Break-point chlorination is no exception as to the rule. Its efficiency in disinfection is beyond doubt; but odor-control presents real—though temporary—problems. When break-point chlorination is first introduced, free chlorine is consumed in stabilizing sludge in settling basins, and organic matter in filters and in the pipes of the distribution system. This may require under such conditions (and also at times of sharp variation in the organic content of the raw water to be treated) excessive doses of chlorine which lead to consumer complaints. After the break-point method has been in continuous use for a sufficient period, the first type of difficulty will disappear; and the problems of adjustment to later variations will be solved by experience and operating skill.

It is apparent that the use of a chlorine dosage sufficient to maintain an adequate residual of free chlorine (rather than chloramines) can secure far more reliable sanitary safety than has been hitherto attainable; and it should greatly advance taste and odor control, oxidation of iron and manganese, removal of odors due to algae and improvement in the appearance of water containing organic coloring matter. All in all, this technique represents perhaps the most significant

advance in disinfection of water supplies since the introduction of chlorination at Boonton in 1908.

## REFERENCES

1. Griffin, A. E., and Chamberlin, N. S. Bacteriological Improvements Obtained by the Practice of Break-Point Chlorination. *A.J.P.H.*, 35, 3:199-210 (Mar.), 1945.
2. Hallinan, F. J. Tests for Active Residual Chlorine and Chloramine in Water. *J. Am. Water Works A.*, 36:296, 1944.
3. Gilcreas, F. W., and Hallinan, F. J. The Practical Use of the Ortho-tolidine-arsenite Test for Residual Chlorine. *J. Am. Water Works A.*, 36:343, 1944.

## ALUMINUM VS. SILICA

IT is now seven years since Denny, Robson, and Irwin at Toronto<sup>1</sup> first pointed out that the addition of metallic aluminum prevented the solubility of siliceous materials *in vitro* and reported that, when rabbits were exposed to quartz dust, they could be protected against silicosis by the addition of 1 per cent of aluminum. Two years later,<sup>2</sup> the same authors presented more detailed and convincing evidence of the importance of this discovery. They demonstrated that metallic aluminum, when hydrated, reduces the toxicity of quartz by flocculation and by adsorption, but chiefly by covering the quartz particles with an insoluble and impermeable coating. They exposed a large series of rabbits for 12 hours a day to natural quartz dust (containing a variable but generally small amount of aluminum); to a mixture of quartz dust and aluminum; and to natural quartz dust for 12 hours plus a 40 minute dusting with aluminum. The percentage of aluminum actually present in the lung was determined.

The tables presented show (when the data are combined and reclassified) that, of the rabbits exposed for less than 200 days, those with less than 0.6 per cent aluminum in the lung showed a 36 per cent incidence of fibrotic change while the corresponding figure for those with over 1.0 per cent aluminum was only 12 per cent. Of animals exposed for periods over 200 days, those with less than 0.6 per cent aluminum showed an incidence of fibrotic change of 79 per cent while for those with over 1.0 per cent aluminum the corresponding figure was only 13 per cent. The investigators note that this influence of aluminum will help materially to account for the puzzling fact that quartz dust from certain country rocks has failed to produce silicosis when it might have been expected to do so (an observation which goes back at least to Haldane in 1917). Recently, Crombie, Blaisdell, and MacPherson<sup>3</sup> have attempted to apply a similar procedure to the treatment of human silicosis. In a series of 34 cases of uncomplicated silicosis with measurable pulmonary disability, this treatment was associated with definite clinical improvement (decrease of dyspnea, cough, pain, and fatigue), although the men continued their employment and exposure to silica dust.

In France, Policard<sup>4</sup> has reported that aluminum dust shows a similar protective action against lesions of the cornea produced by introducing silica dust into the eyes of rabbits. In England, Belt and King,<sup>5</sup> using intratracheal insufflation of aluminum with rats found no protection against silica and also reported harmful effects due to the aluminum dust alone. They did not observe hydroxylation of the aluminum and the conditions of the experiment are so different that they do not bear directly on the Canadian work.

In the United States, when silicosis is in question, we always want to know

what Dr. Gardner thinks. His conclusions strongly support the general conclusions of Denny and his colleagues. Gardner, Dworski, and Delahant<sup>6</sup> have independently demonstrated the protective effect of a colloidal hydrate of alumina which, at Saranac, has proved more efficacious than metallic aluminum powder. They find that "The gelatinous alumina and the quartz may be introduced into the animal body in separate suspensions and even by different pathways without causing silicosis, provided that the inhibitor and the irritant ultimately localize in the same phagocytic cells"; and that "Injection of gelatinous alumina after the quartz causes resolution and healing of immature silicotic tissue reactions," although fibrous nodules do not disappear. An interesting bit of evidence was contributed by the unexpected resistance of supposedly unprotected "quartz control" animals which led to the discovery that rafter dust in the quartz room contained nearly 2 per cent of  $Al_2O_3$ , probably introduced by accident from the aluminum room. An amount of alumina far in excess of what might be contemplated for human therapy was harmless to normal animals but had an unfavorable influence on the development of tuberculosis, suggesting caution in using the procedure in the presence of active tuberculous lesions. The authors conclude that "confirmed experimental evidence proves beyond question that aluminum and aluminum hydrate probably in amorphous state, specifically inhibit fibrous reaction to quartz, and that their administration will prevent progression of silicotic lesions and cause retrogression in immature tissue responses. Inhalation is probably the only effective method of administration. In the doses recommended for human therapy (5 to 30 minutes a day or less frequently), no harmful results are anticipated. Aluminum therapy should be administered only under close medical supervision and should not be used to the exclusion of recognized methods of dust control. Aluminum hydroxide possesses certain theoretical advantages over metallic aluminum and deserves serious clinical trial."

## REFERENCES

1. Denny, J. J., Robson, W. D., and Irwin, D. A. The Prevention of Silicosis by Metallic Aluminum. I. *Canad. M. A. J.*, 37:1 (July), 1937.
2. Denny, J. J., Robson, W. D., and Irwin, D. A. The Prevention of Silicosis by Metallic Aluminum. II. *Canad. M. A. J.*, 40:213 (Mar.), 1939.
3. Crombie, D. W., Blaisdell, J. L., and MacPherson, G. The Treatment of Silicosis by Aluminum Powder. *Canad. M. A. J.*, 50:318 (Apr.), 1944.
4. Policard, A., and Rollet, J. *Compt. rend. Soc. de Biol.*, 132:100 (Oct. 21), 1939.
5. Belt, T., and King, E. J. Failure of Aluminum to Prevent Experimental Silicosis. *J. Path. & Bact.*, 55:69, 1943.
6. Gardner, L. W., Dworski, M., and Delahant, A. B. Aluminum Therapy in Silicosis. *J. Indust. Hyg. & Toxicol.*, 26:211 (Sept.), 1944.



# Shellfish\*

## Engineering Section

FOR several years, the Shellfish Committee of the Engineering Section, American Public Health Association, has discussed with representatives of the Public Health Service and various shellfish producing states the idea of preparing a shellfish manual which could be used throughout the industry to standardize accepted practice. Such a manual would make for uniformity of enforcement by clearly indicating what constituted satisfactory compliance with Public Health Service Minimum Requirements. The Public Health Service has been sympathetic to this idea, and has encouraged the committee to assist in the preparation of such a manual.

A preliminary draft of a proposed manual was distributed in November, 1943. Some 7 months later, in June, 1944, the committee sponsored a meeting at Atlantic City at the annual meeting of the National Shellfisheries Association, the Oyster Growers and Dealers of North America, and the Oyster Institute, at which suggestions and criticisms, based on a brief trial period, were presented.

A few weeks later, at the request of District 4, U. S. Public Health Service, and of regulatory authorities from southeast and Gulf Coast states, the chairman of your committee and the committee member representing the Southern Branch of the American Public Health Association, met at Atlanta,

Ga., in a two day meeting with representatives of these states, and discussed details of the manual with them. This group adopted a number of resolutions, addressed to the Public Health Service, recording their opposition to: (1) floating; (2) repacking; and (3) enforcing the revised manual prior to the termination of the war. They also contributed constructively to the rephrasing of the manual.

Following these two meetings, the Public Health Service held a hearing at Washington, D. C., during the latter part of July, at which representatives of the industry expressed their views of the manual and of the revisions suggested at both the Atlantic City and Atlanta meetings.

The final revision of the manual has not yet been issued by the Public Health Service, but probably will be before long in order that experience with its provisions may be obtained during the present active shellfish season.\*

The meetings held at Atlantic City, in June, 1944, attracted much interest. On June 6, members of the committee attended a meeting, held under the auspices of the directors of the Oyster Institute. To this meeting were invited health officers and members of the industry. The chairman of the meeting appointed a committee consisting of

\* The *Manual* was issued October 18, 1944, to become effective January 1, 1945.

\* Progress Report of the Committee on Shellfish.

COMMITTEE ON SHELLFISH (Engineering Section)

Organized 1928. Published reports: *Year Books* 1934-1935, 1935-1936, 1936-1937, 1937-1938, 1938-1939. 1939-1940, 1940-1941, *A.J.P.H.*, July, 1944.

members of the shellfish industry and requested that the committee meet with our committee on June 7 to present industry's viewpoints on the proposed manual. Below are recorded the high lights of these discussions, all of which centered around the proposed Public Health Service Shellfish Manual.

#### PROPOSED PUBLIC HEALTH SERVICE SHELLFISH MANUAL

Much discussion at all these meetings centered around the desirability of placing the manual in effect during the coming season. Objections were raised on the grounds that because of the scarcity of inspectors and materials, present standards should be tolerated until after the war, when more nearly normal conditions had returned.

A good deal of discussion centered around the suggestion that whenever closed shellfish areas could not be effectively policed, such areas should be depleted of their shellfish every two years, if necessary. It was argued that depletion was an expensive process and was not practical. No alternative solution was offered. Instances were cited where depletion has been carried out at very little expense to the state by permitting bonded purchasers to buy both market size shellfish and those not of market size from closed areas and relay them in approved areas.

In the discussions which took place on June 5 and 6, a good deal of time was devoted to the wording of sentences which defined what constituted satisfactory compliance with requirements. In general, there was great difficulty in agreeing on *definite* statements. Instead, it seemed necessary to word statements in broad, general terms which would permit some latitude of interpretation. From the standpoint of an enforcing agency, statements in specific and definite terms are desirable so that only one interpretation can be placed upon the language. The por-

tions of the shellfish manual describing what constitutes satisfactory compliance with requirements were intended to leave only one interpretation.

Even defining such terms as "wet storage" and "floating" offered difficulties because these terms have, at present, different meanings in different geographical areas. This emphasizes the need of stating in the manual what is meant by these terms, and what the attitude of the regulatory authorities should be toward the practices so defined.

There was difficulty in agreeing that standards should be set for testing the safety of shellfish when the shellfish themselves were being examined instead of the waters in which they were grown. It was also indicated that it would probably be advisable to have standards for shucked oysters different from those for shucked clams and mussels.

Among the suggestions which were believed to be of value was one that the Public Health Service should hold seminars on shellfish sanitation matters similar to the seminars it sponsors on milk and restaurant sanitation work. These seminars have a high educational value and tend to bring about a uniformity of understanding and enforcement procedures and to remove many sources of misunderstanding which otherwise arise in shellfish regulatory activities and practices.

It was also suggested that the Public Health Service should prepare an ordinance for use by shellfish consuming states; that such ordinance could require certain items of sanitation which would prevent deterioration and adulteration of the products after they had left the sources of production. Of particular interest were such ideas as requiring that shellfish be packed immediately after shucking into tightly sealed cans which would not be opened before they reached the ultimate consumer, and that such cans of raw

shucked shellfish be labeled indicating the date before which the shellfish fish should be consumed. It was suggested that a standard code for dating cans should be worked out by the Public Health Service and the shellfish industry. It was suggested that the Council of State Governments could assist in bringing about a universal demand from consumer states that shellfish be shipped only in cans sealed at the point of shucking. It was stated that if these requirements, should be adopted by consuming states, they would greatly accelerate progress in shellfish sanitation.

The group seemed to be particularly interested in breaking up the practice, which apparently prevails in some consuming centers, of retailing raw shucked shellfish from a crock or other containers to which both shellfish and water are added. This results both in adulteration of the product and in perpetrating a fraud upon the consumers. It was also pointed out that in some interior cities, it is believed that some repacking of shellfish now takes place and that there is no adequate supervision of such repacking by interior health authorities.

It was pointed out that improvements in shellfish sanitation could best be brought about by consumer interest and that purchasers of shellfish could most effectively raise the standards of shellfish sanitation by specifying their requirements. Some of the larger purchasers, such as the chain grocery stores, are already requiring, in some instances, that shucked shellfish be packed in family size containers, on which is recorded, usually in code, the date when the container was packed.

A good deal of discussion centered around the repacking of shucked shellfish in producing states. It was believed inadvisable at the present state of shellfish sanitation, and because of the present emergency, to prohibit the

repacking of shucked shellfish but to enforce such safeguards of the repacking processes as might be necessary to protect the product adequately, in spite of the great practical difficulties heretofore encountered. Some details regarding the practices prevailing in the industry where repacking is done were recounted and strongly supported the belief that repacking, as it is now practised in certain producing states, is in violation of sound sanitary practices and should therefore be discontinued.

In the meeting in the afternoon of June 7 with the members of the committee from the industry, statements were made by industry representatives that some of the returnable containers, in which market oysters had been shipped to the Baltimore or the Washington areas, were returned containing materials which indicate that the container had been used for purposes other than those connected with the shellfish industry, and were not properly cleaned before being returned. It was suggested by members of the industry that where the enforcement authorities encounter returnable containers, which were not suitable for use because of deterioration or damage, the state regulatory authorities should be given authority to summarily destroy such containers when they were encountered. This suggestion, however, it was pointed out, was not new since efforts have been made in the past to enforce it, but very many difficulties were interposed when the destruction of unserviceable containers appeared to be imminent, with the net result that very few containers were destroyed and no improvements were made in the practices involving the use of returnable containers.

Some discussion resulted regarding the advisability of closing mussel and clam areas when laboratory examinations disclosed the presence of poisons

in certain concentrations. So far, no one was able to cite any fatal cases on the East Coast due to soft shell or hard shell clams. However, it was felt that some recognition should be given to the presence of the danger, and in areas where serious situations are believed to exist careful studies should be encouraged. It was suggested that the Public Health Service should do some research on this problem but representatives of the Service stated that the Public Health Service does not feel that it can justify devoting resources and funds in wartime to the investigation of a problem in which no fatalities have occurred in view of the pressing and urgent research problems directly connected with the war effort.

It was recognized that on the Pacific Coast, clam poisoning is a problem and that it may also become one on the Atlantic Coast.

Discussions indicated that requiring the substitution of shucking containers with perforated sides and bottoms for water-tight containers could not be satisfactorily justified as a universal requirement throughout the industry at this time. Certain difficulties of cleaning such containers seem to exist.

The suggestion that sorting of shucked shellfish be prohibited on the shucking bench, if it is accomplished by utilizing two or more different containers to receive two or more different sizes of shellfish, was discussed. Such sorting, as now practised, introduces delays in cooling the shellfish. It was pointed out that if the requirement that shucked stock be cooled to 50° F. or less within 2 hours after shucking was enforced, the details regarding the manner of sorting would be taken care of automatically. It was agreed that whenever the inspector encountered sorting on the bench, he would have justification for special investigation into the length of time required to cool shucked shellfish.

A good deal of discussion revolved around the idea that only one-piece metal shucking knives should be permitted. It was argued that such knives are several times as heavy as the two-piece knives with a wooden handle and that they are more costly, and that at the present time, material for their manufacture could not readily be obtained. Stainless steel knives were reported to be 'unsatisfactory' because they break readily and do not resist salt water.

A suggestion that shucked shellfish should not be permitted to come into direct contact with ice during their processing in the packing room was ruled out on the basis that practices in the packing room could be readily controlled to the point where significant risk was not present, and that any risk remaining would be offset by the benefits gained from the rapid cooling of the shellfish made possible by this practice.

At the meeting with the industry, at Washington last July, the question was raised by the Public Health Service as to whether it would not be better for the Service to discontinue its endorsement of shellfish sanitation measures enforced in the various states since there seemed to be so much criticism on the part of shellfish producers of the requirements laid down by the Service. There was general disagreement with this idea, both from the state regulatory authorities present and from the industry. The statement was made that certain other food products, notably milk, did not move freely in interstate commerce because there was no interstate standard; that the manual was not as formidable as it had been pictured; that it should be studied some more and the effective dates for its enforcement should be met in the future.

The spokesman for the industry summed the situation up by saying the industry *does* want a manual, desires

continued collaboration with the Public Health Service until industry is satisfied with the reasonableness of requirements.

Your committee endorses the requirements stated in the shellfish manual as prepared on September 1, 1944, believing that they are based on sound public health principles, and believes that the Public Health Service should insist that these requirements be carried out to a degree sufficient to warrant its continued endorsement of state

shellfish certifications of interstate shippers.

L. M. FISHER, C.E., *Chairman*, U. S. Public Health Service, Chicago, Ill.

L. M. CLARKSON

JOSEPH B. GLANCY

CHARLES G. HAMMANN, SR.

F. GARDNER LEGG

RICHARD MESSER

JOHN O'NEILL

SOL PINCUS, C.E.

EDWARD WRIGHT

---

## Laboratory Service in Local Health Departments

In proposing laboratory personnel for the 1,197 suggested units of local health administration to cover the United States, *Local Health Units for the Nation*\* outlines no universal pattern. It recognizes the wide variety of present goals and performance, as well as the wide variety of methods possible for achieving either limited or maximum objectives. In many states present practice or future plans call for service to many or all local health departments through the state laboratory or its branches. In a number of the states it is the practice for local departments to purchase laboratory service from existing approved commercial or official laboratories.

Because laboratory units are expensive both in personnel and equipment, the committee suggests that for a minimum service, particularly in units with populations of less than 100,000, the state laboratory and its branches can be most economically used.

For 12 states, no local laboratory personnel is recommended. Here the state health officers have indicated that the 278 local units

involved can be served by the respective state laboratories and their branches now in operation or in prospect. In 20 states the same practice is recommended for 153 of the 478 units, and in the remaining states laboratory personnel is recommended for each of the 441 units. However, the committee believes that, because of the small sums presently available for local health service in many states, there might well be an expansion of state service in this area rather than development of local laboratories.

For 766 units with a population of 97,300,000 the total number of workers suggested for local laboratories is 3,535—about 12 per cent professional workers such as bacteriologists, and the remainder almost equally divided between trained technicians and unskilled workers. It is the thought of the committee that except in larger units of 100,000 or 200,000 population, professional supervision will be furnished by the state laboratory as well as assistance in the more complicated diagnostic procedures. It believes this to be a sounder practice both technically and financially than to secure professional leadership on a part-time basis or with below standard compensation that cannot attract scientists of prime competence.

---

\* Emerson, Haven, M.D., and Luginbuhl, Martha, M.A. *Local Health Units for the Nation*, Report of the A.P.H.A. Subcommittee on Local Health Units. Published by the Commonwealth Fund, 1945, \$1.25.

# Water Supply

## Engineering Section

BECAUSE of war conditions it was not considered advisable to attempt any study requiring the collection of statistical data, the circulation of questionnaires, etc. Therefore we have endeavored this year to appraise wartime developments in connection with public water supplies which appear to have a peacetime significance.

### ADMINISTRATIVE PROBLEMS

The dislocation occasioned by the employment of technical personnel in the armed forces probably will continue for some time. There are practically no sanitary engineers, sanitary chemists, etc., now in training. Every effort should be made to cooperate with technical schools in publicizing opportunities in sanitary and public health engineering so as to attract capable students who will prepare for permanent careers in this field. One aspect of this field has received too little attention, namely, the attractive position of filtration plant chemist or superintendent. Certain western schools have emphasized such careers through training at engineering experiment stations and at filtration plants operated by the schools. This need should be coordinated with advances in civil service practice and with the merit system procedures of this Association.

### NEW EQUIPMENT AND MATERIALS

Current literature is filled with references to new equipment, materials, and processes, some of which obviously are not backed by sound manufacturing

programs for the immediate future. It is evident, however, that the very marked advance incidental to the war construction may revolutionize materials, equipment, and even processes, and that an open minded approach to new developments should be adopted to minimize the time lag in the application of new ideas. This is especially necessary in connection with developments outside of the field of water supply which, however, may have a direct application to this field. For instance to quote Mr. Goudey of this committee:

The military forces have been requiring the development of fire-resistant chemicals for weed control at airports, railroad right-of-ways, oil lines, and power lines. It has been necessary to resort to chemical means largely because of man power shortage. Two such compounds have been developed which are widely used by the military forces for this purpose, namely, Nox-weed and ammonium sulfamate. Nox-weed is a special formula containing sodium chlorate but with boron and other substances added for fire-proofing qualities. The chemicals ultimately wash off the vegetation from rain and are no longer fire resistant. Both compounds are safe to use for marginal weed control at reservoirs and will even kill small trees. These chemicals have been successfully used on bulrushes and tules rooted in the water by spraying the above-water portions. It is important not to use excessive doses because the plants are apt not to absorb the poison into the root system. Although Nox-weed contains some boron and ammonium sulfamate and has an end product of ammonium sulfate, which is a fertilizer for algae, there appears to be no detrimental effect with either product in so far as water supply is concerned. It would be desirable after the war to ask the manufacturers to prepare a sodium sulfa-

### COMMITTEE ON WATER SUPPLY

Organized 1922. Published reports: *A.J.P.H.*, Sept., 1924, Apr., 1925, Feb., 1926, July, 1927. Apr., 1928, Feb., 1929, May, 1930, *Year Books* 1930-1931, 1931-1932, 1932-1933, 1934-1935, 1937-1938, 1939-1940, 1940-1941, 1941-1942.

mate substitute which would be better for surface reservoirs. Both compounds have been used extensively on at least one large water system.

The destruction of underwater weeds is being accomplished on a large scale by the use of Chloroben. Large irrigation districts are finding it economical to treat water weeds chemically by this method even though man power for old clearing methods might be available. The compound used in irrigation water produces odorous end products which, however, are not detrimental to human or plant life. In treating domestic water reservoirs a Chloroben of less odor and taste producing qualities is used, but even then considerable care must be taken not to treat too much water at any given time. One large system has used several thousand gallons at the rate of forty gallons per acre, partially controlling *Potamogeton natans* and obtaining as much as 50 per cent kill on the first application. After subsequent applications the growth should be completely destroyed.

Restricted experience in another state with "Benoclor No. 3," manufactured by the same firm, discloses that rooted aquatic vegetation is destroyed but that the material is soluble to the extent of about 30.0 p.p.m., which is well above the concentration of 0.03 p.p.m. found to impart an odor to water. Pending the collection of more comprehensive information it would appear that this treatment procedure should not be used when the treated water will be used at once for potable purposes but that the procedure has promise in the more effective control of rooted aquatic vegetation.

#### POST-WAR PROJECTS

Post-war projects have received wide publicity but it is pertinent for this committee to emphasize the need for enlarging and modernizing many water purification plants in view of enforced operation in excess of designed capacity during the war and because of recent marked improvements in the principles and practices of coagulation, filter washing, and chlorination. It is suspected that the magnitude of such a moderni-

zation program would far outstrip that of post-war projects for entirely new water supply projects but such improvements may lack glamour and may not receive public support unless stressed by appropriate authorities.

#### WATER TREATMENT

Recent developments in the design of water filtration plants definitely emphasize the trend toward the more extensive use of mechanical equipment, more elaborate coagulation and flocculation units and rates of filtration through sand filters in excess of the conventional 125 m.g.d. In some instances this trend is in conflict with existing codes of state departments of health and the *Manual of Recommended Water Sanitation Practice* of the U. S. Public Health Service. This is not the occasion to discuss the technical background which should underlie an administrative policy toward this trend but the situation is being mentioned at this time because it is very evident that state sanitary engineers and other officials entrusted with the approval of plans for proposed water filtration plants must carefully consider these developments and be in position to protect the public health without unduly restricting technical developments. In this connection reference is made to a committee study now in progress by the American Water Works Association to collect performance data at plants where short term sedimentation and high rate filtration are practised.

Reference also is made to research work at Fort Belvoir, Va., which has been reported upon by Black,<sup>1</sup> where diatomaceous earth has been used as a filter medium in place of sand. Additional unpublished data of the Army on this investigation indicate that a diatomaceous earth filter consisting of a fine-grained porous element or screen to which a "precoat" of diatomaceous earth is applied in amounts of about

0.15 lb. per sq. ft. of effective area frees coagulated and settled water to which diatomaceous earth is added as a "filter aid" of turbidity, bacteria, and the cysts of *Entamoeba histolytica* with filtration at rates of 6 to 10 gal. per min. per sq. ft. of filter area. The unit is pre-coated by circulating filtered water to which the diatomaceous earth has been added in appropriate quantities. While it would appear that considerable work still is needed to establish this new filtration process for public water supplies it is evident that an entirely new technique is being developed which may revolutionize water filtration.

The excellent performance of conventional rapid sand filtration plants has created confidence in the purification process involved without due regard being given to the paramount problem of providing effective operation. Accordingly many small filtration plants are constructed without thought as to the employment of trained operators or the availability of sufficient funds to insure effective operation. The trend toward more complex mechanical equipment therefore implies an obligation to provide capable operators. An increase in the salary scale of operators is of basic importance to the continued advance in water purification. This in turn implies the need to extend the program of licensing or certifying qualified operators to insure permanency of employment. There also is a need for extension courses for operators, which should be integrated into the official state programs of licensing operators.

The cost of operating treatment plants also focuses attention upon the need for further consideration being given to wells, springs and infiltration galleries as sources of public water supply. Greater attention should be given to the utilization of small slow sand filtration plants which can be oper-

ated with less skill than the average mechanical filtration plant. It would seem very pertinent for state departments of health to publicize the over-all problems involved in selecting sources of public water supply in order that budget provisions may be made for effective operation of proposed supplies rather than chief attention being directed to first cost.

Mention should be made of the proposed application of sodium fluoride to several water supplies to demonstrate whether this treatment procedure will lead to a reduction in the incidence of dental caries among the growing children in the communities served. Final plans are now being made for the treatment of the water supplies of Grand Rapids, Mich., and Newburgh, N. Y., and possibly a community in Canada. These demonstrations will continue for a period of ten years and will be accompanied by thorough dental and medical surveys of the children involved. This new development represents the first time a chemical has been added to public water supplies for purposes other than purification, except the application of sodium iodide to the water supply of several communities for a short period years ago, for the purpose of preventing goiter. So far very favorable public response has been received. There seem to be no engineering problems surrounding this treatment procedure.

The science of water chlorination has outstripped the application of known principles. For instance, boilers and pumps usually are installed in duplicate whereas too little thought is given to duplicate chlorination equipment. In fact, this is one of the paramount weaknesses in water treatment, although most everyone realizes that continuously effective treatment cannot be insured otherwise. Duplication should be extended to include auxiliary equipment of chlorinators so that in



case electric power fails and a standby engine-driven pump is operated the chlorinator also will function. One method of simplifying this problem is to have auxiliary engines also drive small generators to furnish current for a minimum amount of light and for the operation of small motor-driven pumps for chlorinator injectors or the small motors of hypochlorinators. The value of "standby" auxiliary power has been emphasized recently along the Atlantic seaboard by the recent hurricane.

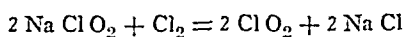
Another fruitful field for improving public water supplies is the chlorination of surface supplies which now are delivered without treatment. About 568 surface supplies are now being operated without treatment, according to a study which represents statistics for about January 1, 1943. The following tabulation classifies chlorinated and unchlorinated water supplies in terms of population served.

<i>Chlorinated Surface Water Supplies</i>		<i>Unchlorinated Surface Water Supplies</i>	
Under 500	368	Under 500	267
500 to 1,000	460	500 to 1,000	149
1,000 to 5,000	1,264	1,000 to 5,000	137
Over 5,000	936	Over 5,000	15
Total	3,028	Total	568

As might be expected the greatest number of chlorinated surface supplies are those serving large populations and conversely the greatest number of unchlorinated surface supplies are those serving small populations. The treatment of small water supplies was both expensive and frequently difficult before the development of small size hypochlorinators. Satisfactory means are now available, however, for treating even the smallest supplies. There is a trend also to chlorinate well supplies for sanitary and esthetic reasons, there being many instances when such supplies should be chlorinated. The com-

mittee therefore stresses the need for correcting this fundamental defect in public water supplies.

Research with chlorine dioxide<sup>2</sup> for the control of tastes and odors has resulted in such favorable preliminary results that the subject is being reviewed at this time because the only published material deals with the effectiveness of the compound as a disinfectant. Chlorine dioxide is formed as needed by forcing a concentrated solution of sodium chlorite into the solution hose of a chlorinator conducting chlorine water to the supply being treated. The strong chlorine water has a pH less than 4.0 required for the formation of chlorine dioxide in accordance with the following formula:



Experience in the treatment of the water supply of Niagara Falls, N. Y., has demonstrated that tastes and odors incidental to algae growths, the woody tastes apparently incidental to decomposing organic matter, and the medicinal tastes incidental to industrial wastes can be destroyed by doses of chlorine dioxide between the limits of 0.25 p.p.m. and 0.6 p.p.m. under the conditions surrounding this supply. Obviously a number of supplies must be treated before the range in required doses and effectiveness can be determined more accurately. Either raw water or previously chlorinated water may be treated, although economy can be secured by the practice of post treatment. In practice sufficient chlorine is added to react with the sodium chlorite and to provide an excess for disinfecting purposes. While chlorine dioxide is a disinfectant in itself, its germicidal power as compared to chlorine needs to be studied more fully. On the other hand, chlorine dioxide increases the oxidation potential of the treated water and thus facilitates disinfection. As other supplies are to be

treated on an experimental basis, more extensive information should be available without undue delay.

#### IMPROVED CONTROL OF CHLORINATION

Recent technical literature has demonstrated conclusively that the effectiveness and rate of disinfection with chlorine or chlorine products is closely associated with the oxidation potential, and that superchlorination reactions produce a high oxidation potential as indicated by the presence of free or more "active" residual chlorine as contrasted to chloramines. It is also quite well established that the "flash" test is a useful qualitative test for more active residual chlorine although subject to error through the influence of manganese. This important development, however, has been restricted largely to supplies where superchlorination is practised for improved taste and odor control. There is a tendency, however, to adopt superchlorination for improved disinfection, and in fact the whole subject of chlorination is undergoing an important refinement which warrants close study so that improved techniques may be used more widely.

The "flash" test is only qualitative in that the resulting color is changing so rapidly as to prevent accurate comparison with the standards. The orthotolodine-arsenite (OTA) test,<sup>3</sup> however, provides a quantitative determination which distinguishes between more active chlorine and chloramines and in addition provides a quantitative measurement of any errors incidental to interference by manganese, nitrites or iron with the o.t. reaction. The important point therefore is that the OTA test provides an accurate quantitative test for the control of superchlorination and also enables conventional chlorination to be appraised. Such an appraisal has disclosed that many raw waters contain sufficient free ammonia to form chloramines without any

thought having been given to the fact that chloramine reactions prevail rather than those due to free chlorine. In other instances serious errors due to the presence of manganese have been disclosed.

It is very evident, therefore, that these technical developments should be utilized more generally to improve the control of chlorination as well as indicate conditions which justify the abandonment of chlorination or the adoption of superchlorination to insure rapid and effective disinfection.

#### "LABORATORY CONTROL"

The inability to purchase laboratory supplies during the war draws attention to the need for post-war expansion of laboratory control of public water supplies. This expansion, however, should be integrated carefully with the actual operational needs of water supply officials because there seems to be a tendency to over-emphasize the mere number of samples examined without due regard being given to the coördination of sampling points and the frequency of sampling in terms of operation and supervision and without the laboratory technique being adapted to disclose information actually needed by the operators. It is believed that this tendency should be counteracted by an educational program by state departments of health to emphasize the true function of control laboratories so that undue weight will not be given to the bacteriological examination of samples of water merely to disclose its sanitary quality. In other words the important point is that integrated effective control will insure a safe supply, whereas uncoördinated bacteriological examinations of samples will disclose only that a supply was safe or unsafe at the time the samples were collected, which information is available only after the conditions prevailing at that time have changed.

#### NEW BACTERIOLOGICAL MEDIA FOR WATER EXAMINATION

Everyone is aware of the inherent weaknesses of the standard test for coliform organisms, especially the work and time consumed in utilizing two separate media in the routine test. It seems very significant, therefore, that current experience with lauryl sulfate tryptose broth<sup>4, 5</sup> and buffered tryptose lactose bile salt, Eijkman or EC medium,<sup>6</sup> are quite favorable, although experience with the former had not been so favorable in the Southwest. The indications are that either of these media may provide a specific and simplified test for coliform organisms within 24 hours, or at most 48 hours, without the need for confirming positive results. Every effort should be made to facilitate this important development.

#### SUPERVISION OF DISTRIBUTION SYSTEMS

The prevention of secondary pollution of potable water supplies through cross-connections with potable supplies and the attention being directed to the bacterial content of water flowing through distribution systems because of the 1942 revision of the U. S. Public Health Service Drinking Standards, coupled with the demand of Army officials that water supplies serving Army posts, etc., contain 0.4 p.p.m. residual chlorine, has drawn attention to the overlapping problems pertaining to the operation of distribution systems so as to insure the delivery of attractive water of safe sanitary quality to the public. The difficulty of course is that the solution of any one aspect of this problem frequently complicates other aspects so that it is necessary for the whole field to be restudied for the development of fundamental principles which will provide the necessary administrative and technical procedures. It is significant, therefore, that a committee is now being organized for this

study by the American Water Works Association.

Preliminary work has disclosed that distribution systems support a larger variety of organisms than might be anticipated from data disclosed by the agar count or tests for coliform organisms. While this is to be anticipated it is significant that the studies so far have not solved any problems but have merely disclosed the complexity of the subject. For instance, it is not clear whether members of the coliform group will actually develop on "pipe slime," whether such organisms originally present in the raw water may be temporarily rendered inactive to be followed by periods of growth in distribution systems when residual chlorine disappears, or whether organisms embedded in sediment may collect in pipes and be thrown into suspension during periods of high flow, etc. Obviously until more light is thrown upon these uncertainties the interpretation of the sanitary significance of coliform organisms present in samples from distribution systems will be quite difficult.

Another illustration of this complex problem is that biochemical activity in distribution systems may be responsible for objectionable tastes, such as through the reduction of sulfates to sulfides, while other growths might be responsible for obscure aspects of pipe corrosion which cannot be explained by the electrolytic theory.

#### WATER-BORNE TROPICAL DISEASES

The interest in tropical diseases incidental to the war has led to considerable publicity being given to the subject in current literature, some of which might be misinterpreted as signifying a serious menace to the health of the citizens of this country. Epidemiologists have been cautious when discussing this subject, as illustrated by the following quotation? from Gaylord W. Anderson, Lt. Col., MC, AUS.

Today the situation is far different. We have a greater proportion of our population outside of our territorial limits than ever before in history. Even more significant, we have them scattered in all corners of the globe and many of them in the most disease infested corners of the globe, in areas where diseases known to us only by name are a local commonplace, in areas where conditions that would be museum curiosities in this country affect the majority of the native populations. . . . It is logical, therefore, to ask us to the extent to which our soldiers returning victorious at the end of this war, may unfortunately return infected and because of their infection, introduce disease into the United States.

This is by no means a new idea. Already much has been written and published regarding the risk of introducing new diseases to this country or bringing back increased quantities of diseases that we now have. Much of this literature is of an alarming nature, portraying at times in high sensational form, a dire calamity that, like the sword of Damocles, hangs over our heads, ready to precipitate disaster unless drastic control measures are adopted. Conversely, others, more conservative, and I believe with more careful appraisal of historical epidemiology, fail to find cause for alarm and seriously question whether or not these diseases can be introduced in such quantity as to constitute a menace or whether, once introduced, these infections can establish a foothold in this country. I confess at the onset that I belong to this latter group. . . .

It is significant that many of the tropical diseases are insect-borne and while important are not of direct concern to this committee. It is pertinent, however, to review briefly certain administrative aspects of water-borne tropical diseases.

Typhoid fever, cholera, bacillary dysentery, and amebic dysentery appear to be of significance in this connection. Typhoid fever is under control in the Army and very well established procedures are generally followed in this country for the prevention of spread of this disease when of domestic origin so that imported typhoid fever does not appear to represent a menace. There is little exposure to cholera except for the troops in India and China

and apparently no cases have occurred so far in our Army. Furthermore carriers of this disease do not exist, so it would seem that cholera can be considered as of no administrative significance.

While bacillary dysentery is endemic in this country it would appear that the Shiga type of this disease does not occur. However, there is the possibility of this more serious type of bacillary dysentery being imported from the South Pacific. One gains the impression, however, that this potential menace can be satisfactorily handled by utilization of present procedures, but naturally there may be areas where conditions are such as to require special vigilance.

The situation in regard to amebic dysentery is more favorable in that this disease is not widespread in this country even though there is definite evidence that 5 per cent to 10 per cent of the total population harbor *E. histolytica*. Amebic dysentery contracted in Burma, India, and the Philippines is said to be more serious to Americans entering these countries than when contracted in the United States. This may be due to mass infection under conditions prevailing in the tropics, or to greater virulence of the organism involved. It would appear, however, that the importation of additional carriers of this disease will not materially influence the favorable situation now prevailing because it appears that fresh and rather gross pollution of potable water with sewage from populations including active carriers is required before outbreaks occur, such as the well known Chicago outbreak. Again to quote Anderson:

Undoubtedly some of our soldiers will acquire amebic dysentery infection in foreign lands and may return to this country harboring the amebae. Yet when we consider that about 2-10 per cent of the population of the United States probably harbors the cysts of the *Entameba histolytica* I cannot become

alarmed about the addition of a few hundred thousand individuals to a reservoir that now probably numbers around ten million. The probable reasons why amebic dysentery is so rare in this country in spite of the large reservoir of infection need not concern us here. The risk of introducing bacillary dysentery seems also slight in view of the rarity of really chronic carriers.

It is fortunate that this is the case because it has been demonstrated that the cysts of *E. histolytica* are resistant to doses of chlorine which are applied normally to potable water supplies except when superchlorination is practised, although effective filtration at the rate of 2 g.p.m. per sq. ft. has been found to remove the organisms from water. This also applies to diatomaceous earth filters even with higher rates of filtration.

Schistosomiasis is a disease known to be endemic in tropical and sub-tropical countries. Infection results from contact with water containing the cercariae of the schistosome either through bathing or from drinking water containing the cercariae. A limited number of cases has been reported among the Armed Forces. Certain species of snails serve as host of the parasite. The National Institute of Health, U. S. Public Health Service, is studying schistosomiasis and all species of domestic snails which might serve as intermediate host of the parasite. It is significant that the cercariae will penetrate sand filters. Studies conducted by the National Institute of Health, U. S. Public Health Service, have demonstrated that cercariae are completely removed by diatomite filtration. The sanitary significance of schistosomiasis in the United States

imported by infected troops, returning from foreign theaters cannot be accurately predicted at this time.

It would appear evident that valuable and somewhat unique developments in the field of public water supply are likely to result from the research work during the war and that certain problems have been emphasized by the war effort. The committee therefore stresses the need for a stocktaking at this time in order that fruitful use might be made of new knowledge during the transition period to peacetime conditions.

#### REFERENCES

1. Black, Hayse H. Army Field Water Supply Developments. *A.J.P.H.*, 34, 7:127 (July), 1944.
2. McCarthy, J. A. Bromine and Chlorine Dioxide as Water Disinfectants. *J. New England W. W. Assn.*, 58, 1:55 (Mar.), 1944.
3. Hallinan, Francis J. Test for Active Residual Chlorine and Chloramine in Water. *J. Am. Water Works A.*, 36, 3:296 (Mar.), 1944.
4. Cows, P. B. A Modified Lactose Broth for Use in the Presumptive Test. *J. Am. Water Works A.*, 30:979, 1938.
5. Mallmann, W. L., and Darby, C. W. Uses of Lauryl Sulfate Tryptose Broth for the Detection of Coliform Organisms. *A.J.P.H.*, 31, 2:127 (Feb.), 1941.
6. Perry, C. A., and Hajna, A. A. Further Evaluation of EC Medium for the Isolation of Coliform Bacteria and *Escherichia Coli*. *A.J.P.H.*, 34, 7:735 (July), 1944.
7. Anderson, Lt. Col. G. W. The Threat of the Spread of Tropical Diseases to the United States. Unpublished paper read before American Society of Civil Engineers, Jan., 1944.

CHARLES R. C6x, *Chairman*, State Department of Health, Albany, N. Y.

HAYSE H. BLACK

H. J. DARCEY

ARTHUR E. GORMAN

RAYMOND F. GOUDEY

L. L. HEDGEPEETH

HAROLD STEPHENS HUTTON, C.E.

ARTHUR D. WESTON

# Post-War Sanitary Engineering Problems\*

## *Engineering Section*

A NUMBER of agencies and associations are studying and reporting on post-war sanitary engineering plans and programs. This committee has endeavored not to duplicate any of these known efforts and to present here some of the more important sanitary engineering problems of special concern to public health administrators. These problems include the return of engineers from military life; deficiencies in sanitary facilities due to the necessary postponement of alterations, extensions, and new construction for the war period; housing; public health education for engineering leadership; and administrative relationships of professional engineering personnel for their most effective utilization.

### APPRAISAL OF NEED FOR SANITARY ENGINEERING PERSONNEL

In endeavoring to make an appraisal of the need for sanitary engineers and sanitarians in local, state, and private health agencies after the war, some consideration should be given to the influences which have increased the demand for more sanitation services throughout the country.

State and local health departments are now greatly depleted, in fact, down to skeleton form. The 800 sanitary engineers expected to return from military life in the next two years could probably be absorbed by the 48 state health departments alone. Local and state health departments before the war employed approximately 5,000 sanitary engineers and sanitarians. With the expansion foreseen by the American

Public Health Association committee working on full-time health services for the entire country, some 12,000 sanitary engineers and sanitarians will be needed.

Malaria control, typhus fever control, and food and restaurant sanitation programs have been enlarged and will continue at the increased size for some time. Industrial sanitation will call for additional sanitary engineers to maintain even a minimum program in the states, in the opinion of those directing the work. Should a public works program be inaugurated by the federal government after the war, probably rural sanitation, stream sanitation, water supply improvements, and sewage disposal works would be included. These call for planning and direction by sanitary engineers. It seems reasonably certain that the fields of sanitary engineering and sanitation are likely to increase and expand both in areas served and in functions performed.

Certain war emergency classifications have been set up in the merit system schedules for sanitarians and other public health personnel recruited, and short in-service training courses have been given during the war. It should be provided that such workers be given an opportunity to qualify for subordinate positions in the health departments as the experienced, trained workers return to their positions from military service.

The available man power to fill responsible positions in sanitary engineering and sanitation for the next few years must of necessity come from the returning veterans, and the war workers released by industries which

\* First Report of the Committee October 3, 1944.

undergo conversion to products for civilian use. Some plan should be devised by the U. S. Public Health Service and the states working together, to reach these young men and women in the demobilization centers, with information concerning training courses, opportunities for security and the rewards of a career in public health engineering or allied sanitation activities.

The Procurement and Assignment Service, War Manpower Commission, has established a roster of sanitary engineers for the purpose of assisting the Army and the U. S. Public Health Service in obtaining commissioned officers to serve in the sanitary engineering fields, and at the same time to maintain essential sanitary engineering services for protection of the health of civilians.

At present the records in the Procurement and Assignment Service indicate that there are 984 sanitary engineers in the Army, 127 in the Navy, and 530 in the U. S. Public Health Service. Some of these commissioned officers will continue their careers after the war in the several federal services which have been expanded and will remain somewhat enlarged due to the war's influence. It is estimated that of this total of 1,641 sanitary engineers, approximately 50 per cent, or 800, may return to civilian public health activities in the next two years.

It is conceivable that the roster of sanitary engineers set up to serve military and civilian public health protection in wartime might be converted into an agency which would serve sanitary engineers returning to civilian life.

#### SANITATION FACILITY NEEDS

There have been major adjustments best to serve the total war effort, not only in sanitary engineering services but in the fields of water, sewerage, housing, and other sanitary works

where there has been an almost total postponement of alterations, extension, and new construction, except in critical areas to serve the war needs.

Deficiencies in water supply, sewage, and other sanitation facilities in urban and rural areas are being evaluated by those agencies interested in the public health importance of meeting these needs—and by those concerned with the significance that the construction activities might have in stabilizing post-war employment conditions. In this activity, state sanitary engineers, cooperating through the Conference Committee on Post-War Planning, have prepared a report which when released will give the scope of work needed to meet recognized deficiencies in public water supply and sewerage. Concurrently, the U. S. Public Health Service has undertaken and published reports on similar evaluations of sanitation facility needs including both rural and urban areas. These data indicate the importance of centering public attention on this field of post-war construction activity. The priorities of war have greatly increased the amount of deferred maintenance of these essential utility services. The need for the extension and betterment of existing facilities is easily established and should have early consideration in the post-war period. The Public Health Service has estimated that there now exists a need for the construction of improvements to existing public water supplies costing in excess of one-half billion dollars (\$502,340,000). The deterioration of the sources of public water supply, due to a failure to maintain and extend adequate treatment facilities for both domestic and industrial sewage wastes, gives an emergency aspect to the need for an early start on a sewage treatment plant construction program on a comprehensive basis. The Public Health Service has estimated that there now is a need for over one billion dollars (\$1,055,150,000)

worth of construction in this field alone. Since not all sewage and waste treatment projects are of equal public health interest, a program of the magnitude indicated should recognize the importance of giving early construction priority to the more urgent situations.

Surveys of unmet needs in the sanitary as well as other fields of construction activity are of practical value in that they call attention to the economic folly of any repetition of made work programs for unemployment relief. If construction programs can be prepared with proper emphasis on developing coöperative responsibility on the part of local governmental units, permanent progress may be assured. It is important that governmental procedure used in the promotion of the national interest in unemployment relief recognize the need for the coöperation of those agencies of government having knowledge of the economic loss from not providing needed improvements. The cost of new sanitation facilities, estimated by the Public Health Service to total approximately three and a one-half billion dollars, should not be regarded as a drain on our national resources. Rather it is a means of stopping the economic loss due to a failure to provide these services and the protection consequent upon their construction.

#### PROGRESS IN PLANNING SANITARY WORKS

The Committee on Water and Sewage Works Development, created by the American Water Works Association, the New England Water Works Association, The Federation of Sewage Works Associations and the Water and Sewage Works Manufacturers Association has been active in calling to the attention of public administrators the importance of water and sewage work in post-war planning—epitomized in the slogan "BLUE-

PRINT Now—for Tomorrow's Needs." Latest (Sept. 8, 1944) available statistical data as released by the A.S.C.E. Committee on Post-War Construction indicate that the potential construction program in water works is \$454,000,000, with plans under way or complete totaling \$258,000,000. On the sewerage sector the potential construction program is \$756,000,000 with \$456,000,000 "on the drafting boards." During "normal" times water works expenditures average \$80,000,000 yearly and those for sewerage, \$91,000,000. During the peak PWA period these figures were \$163,000,000 and \$160,000,000, respectively.

Despite these figures, which are so impressive, it should be pointed out that the needs after these war years of deferred construction will be greater. However, the progress on advance planning of work to be constructed after the war, as compared to needs, indicates a reluctance on the part of public officials to provide the funds necessary for the preparation of detailed plans and specifications. This is true despite a general public recognition of the need for such planning. If planned public works are to assist in providing an emergency channel for any flood of post-war unemployment, it is essential that the work be carried to the blue print stage well in advance of this need.

#### HOUSING NEEDS

Urban health departments have long taken an official (although frequently vicarious) interest in housing problems, first through study of the incidence of disease among slum dwellers, later through the enforcement of regulations pertaining to sanitary conditions in residential areas, and more recently through the appraisal of housing conditions. Despite this long history of activity and some slight improvement in interest, little has been done by health



departments to disturb the basic pattern of the "blighted areas" and slums.

The organization of a housing program by a local health agency involves several distinct but interdependent steps. The primary problem is one of study to determine housing needs, underlying causes of slums, factors which determine the shifting and spread of blighted areas and the place of the department of health in the total effort of any community to improve housing conditions. At the same time each community, lead by the department of health, must define a minimum standard for occupied dwellings. The standard is needed as attempts are made to evaluate housing conditions; in setting up enforcement regulations, and in determining costs to support or finance houses which are repaired to meet the standard.

Desirable and practical standards for new housing and for new communities have been and are being developed in those communities where public housing authorities exist. Private housing construction is controlled in most urban communities through building codes, planning commissions, and zoning ordinances. Much remains to be done to bring these two standards for new housing closer together. One is positive in its use—the other is largely negative in its control and may not be up-to-date.

Health departments, in order to exert a constructive influence on these house building programs, must be in possession of facts and familiar with the problem. Efforts in the enforcement field without an understanding of the overall problem as it exists in each urban area are wasteful and unsound. Houses and homes cannot be treated in enforcement programs as restaurants, dairies, or nuisance complaints. People must live somewhere and they must pay their way, except as relieved in part in public housing or as welfare clients. Health officers should be wary

of schemes, based on the payment by welfare agencies of rent allowances for low income groups, as this infers that the community will increase the funds available to the welfare department to make it possible for the owners and attractive to builders to maintain or to build low cost housing for welfare clients. Unless such new funds are made available, and this seems extremely unlikely, the suggested scheme will obviously perpetuate slums and blighted areas.

The desirable housing activities of a local health department engineer should include:

1. Study of housing needs for the community.
2. Definition of minimum standards for existing housing and securing community agreement thereon
3. Determination of cost of meeting the minimum standard for existing housing
4. Preparation of a housing code
5. Examination of standards in use to control new houses and communities in comparison with public housing standards
6. Preparation of a sound program for the department of health in relation to an overall housing program of the city
7. Development of a comprehensive inspection program properly integrated with the total effort of the area

The public health engineer in each urban area should take an active and leading part in initiating studies and in coordinating housing effort. This is one of the most challenging problems before the public health engineer today. It is late, but a start should be made as there is no short cut to a sound housing program.

#### ENGINEERING AND PUBLIC HEALTH EDUCATION

The engineering division in local, state, or federal health departments should cooperate rather closely with the health education division, as the latter group can be most helpful in making efforts in the engineering field effective and successful.

The health education division can aid in producing good and effective literature prepared in an attractive form for specialized propaganda as to needs and measures known to be effective. Health education if improperly used can damage a program and hinder progress by selling unsound ideas and procedures to the people. Furthermore, the health education division should be especially valuable in working out educational methods in the sanitation field to aid the field engineers, sanitarians, and inspectors to become truly effective health educators. An educational program is an essential part of the activity of each service division and consultation in educational methods should be available in the department.

#### EDUCATION FOR LEADERSHIP

The preparation of an individual for a health department career in sanitary engineering presents many problems in selection, education, and training. Intangible qualities such as leadership, ability to get along with people, vision, and social awareness are essential attributes without which an otherwise competent and well trained person may be unable to achieve success in the administration of a sanitation program. Any engineer who has served successfully as an administrator in a local health unit can testify to this fact.

It is evident that, if the scope of engineering activities in health departments is to grow properly, leadership will have to be developed. Although it is easy to train technicians, the education of leaders is difficult. The Association Committee on Professional Education has outlined the educational qualifications for engineering and sanitation personnel, to be employed in health department.

#### PERSONNEL ASPECTS

Public health work is essentially personal service. The availability and

quality of specialized personnel are, therefore, primary requisites in the performance of public health functions. Engineers are as necessary for sanitary engineering services as are physicians for medical duties. Competent technical assistants (sanitarians) for the engineer are as vital in the field of sanitation as are well trained nurses to the medical director. The slowness of administrators and the inertia of governmental agencies in recognizing these facts are painfully apparent, but post-war progress in the wider control and improvement of environment for the betterment of the public health and comfort demands positive adjustments of the public health policy and organization to this end.

Engineering is a profession parallel to that of medicine. In the historical development of public health work, it is recognized and accepted that physicians should occupy the executive positions having general administrative responsibility. However, professional functions are not interchangeable and the achievement of maximum results in public health organization requires engineers in administrative positions with the authority to unify and direct all engineering and sanitary work. The engineer, representing one of the two major professions engaged in public health work, is properly second in rank and responsibility to the executive head of the organization for all engineering services. This is being repeatedly demonstrated in practice where rational organization has permitted capable engineers to function.

Similarly, the compensation and the organizational rank of engineers should be on the same level as that of physicians heading other special services. There can be no longer any justification for the invidious distinctions which have been and are being maintained against engineers in the matter of their employment, pay, and rank. Proper

recognition of engineers and of technical personnel can be withheld only at the expense of a balanced public health program.

There is no local health jurisdiction that does not require engineering service. Admittedly, many local health areas are now too small to employ an engineer efficiently. Consequently, the need must be met through the provision of engineering personnel from a level above the small local units, so that both professional service and technical supervision may be locally available as required. The sanitary engineering functions within a state should be carefully integrated from the state division down through districts, to counties and municipalities with direct lines of technical contact.

In those political jurisdictions where the legal responsibility for the public health protection of the environment has been delegated in full or in part to the local health department, it is recognized that the health officer cannot fully discharge his legal responsibility for the public health protection for those phases of the environment for which he is responsible without qualified engineering service under his direction. This is generally the case in municipal health departments but not always so in county health departments. In all political subdivisions of the state, for those activities in which responsibility has not been delegated, there must be no interposing of intermediary medical personnel in the professional relationships of state and local engineers, outside of purely administrative organization.

State divisions of local health administration, whose chief functions are to promote and coordinate local public health medical functions and administration, have in some cases, presumed to act as the medium of contact between state and local sanitation personnel, with disruptive effects. The lines of

communication and contact between state and local engineers in such areas must be kept clear and direct.

Areas adapted to the performance of local medical health work do not necessarily coincide with areas most suited to sanitary functions. In the establishment of local health centers, decentralization of medical services is the chief objective, but there are decided disadvantages in breaking sanitation work into similar small units unless definite responsibilities for the public health engineering protection services of his community have been legally delegated to the health officer of such a district. In such cases, the health officer must have a qualified sanitary engineer under his direct supervision in order to discharge these responsibilities properly. Sanitary engineering personnel should not be placed under the supervision of a health officer of a subdivision of some local political unit unless legal responsibility for public health protection of the environment of the area under his jurisdiction has also been assigned to him.

Two basic principles of administration should govern in all relationships of health officers to sanitary engineering services; the first being that all sanitation services should be directed by a qualified sanitary engineer, and second that the director of such engineering services should be responsible to the health officer having legal responsibility for the sanitation of the environment of the community under his jurisdiction.

All phases of environmental sanitation require close engineering direction and coordination. Administration and office quarters for sanitation personnel should ordinarily be centralized and, unless governed by political boundaries, the area served should be limited only by the practical economies of travel and transportation of field employees or in consideration of public relationships.

Urban health departments are either isolated or integrated with respect to other agencies of the community depending upon their ability to approach common problems from the appropriate technical viewpoints. With engineering personnel, health departments are able to develop mutually beneficial relations with such agencies as planning and zoning boards, housing authorities, building and public works departments, water and sewer departments, and plumbing boards, as well as a number of private organizations whose primary interests are in community environment in its various aspects. The influence exerted by a health department depends upon its ability to speak the language of the numerous other agencies and interests of a community, among which a county medical society is by no means exclusively important.

Civil service or local political restrictions, requiring local residence as a condition of employment hamper professional employment and force the tax paying public into the employment of mediocre or poorly qualified personnel. The general custom for governmental units to make residence primary and education and experience secondary in its employment requirements is not only poor business but promotes provincialism and retards progress. The ultimate effect will be to exclude the younger generation of any particular county, city, or state from the great field of employment throughout the United States and to limit aspiring and trained young people to the few public service positions occasionally available locally. The young engineer or physician who has carefully prepared himself for a professional career finds himself barred from many jobs reserved for the poorly qualified home town boy. Similarly, a whole generation, now in school, may find itself excluded from government civil service by the arbitrary preferences being granted to veterans, disabled or

otherwise, regardless of how slight their qualifications may be for such technical positions.

Fortunately, the existing need for trained sanitary engineers in health departments throughout the United States coincides with an unusual supply of such personnel shortly to become available upon the demobilization of our victorious military forces. It will be the duty and opportunity of local governments and of health administrators throughout the nation to make use of these men in the achievement of the greater public health objectives which lie ahead.

#### SUMMARY

An estimate of post-war needs for sanitary engineers in health departments and a method of facilitating the return of sanitary engineers from military to civilian life is suggested. The deficiencies in sanitation facilities are being evaluated by those concerned with the significance that post-war construction activities might have in stabilizing employment conditions in the post-war period. The estimated cost of improvements to existing public water supplies is in excess of one-half billion dollars. The total overall cost of new sanitation facilities, is estimated by the Public Health Service as approximately three and one-half billion dollars.

The Committee on Post-War Construction of the American Society of Civil Engineers on September 8, 1944, released the following figures on the potential construction program: in water works \$454,000,000 and in the sewerage field \$756,000,000.

The problem of housing and some suggestions for meeting the issues are outlined.

It is pointed out that an educational program is an essential part of the activity of an engineering service in every health department. The engi-

neering phases of the educational program must be well integrated with the engineering service program.

The need for a professional acceptance of engineering leadership in the field of sanitation in order to secure maximum progress in reaching public health engineering objectives is stressed.

A. H. FLETCHER, *Chairman*,  
125 Worth St., New York

EARNEST BOYCE

J. L. BARRON

E. L. FILBY

JAMES M. JARRETT

M. A. POND

E. S. TISDALE

---

## More Public Health Nurses Will Be Needed

*Local Health Units for the Nation*, soon to be published by the Commonwealth Fund, indicates that if basic minimum full-time local public health services were organized to serve every person in the United States, more than 26,000 public health nurses would be required. This estimate is based on a standard of one public health nurse per 5,000 population for a public health nursing program including school nursing but not bedside care of the sick. The study, the report of the association's Committee on Local Health Units under the chairmanship of Dr. Haven Emerson, found that in 1942 fewer than 15,000 public health nurses, including school nurses, were employed by official local health agencies. In other words, nearly twice as many nurses are needed for a minimum program as are currently employed even while some cities or counties have already gone beyond a minimum program.

The 1944 figures of the National Organization for Public Health Nursing indicate that there are only about 21,000 public health nurses in the country employed by all types of agencies, official and voluntary. Fewer than 30 per cent of these, or only about 6,000, had had a year of postgraduate work in public health nursing as specified in the suggested professional qualifications for public health nurses.\* In other words, fewer than one-fourth of the number that will be required have the pro-

fessional training recommended by the Association's Committee on Professional Education. Here is one area of unfilled needs for returning nurse veterans of the present war.

The study of the Committee on Local Health Units also indicates a great shortage of clerical staff in local public health services. Such a shortage frequently results in making the nurse shortage even more acute since nurses must perform many clerical duties that could be more economically performed by less highly paid workers. The committee estimates that it will take nearly 9,000 clerks to staff a minimum service, whereas in 1942 fewer than 5,200 were employed. The minimum standard set by the committee is for one clerk per three nurses, or one per 15,000 population.

In setting up a tentative plan for minimum basic local health services, the committee suggests that fewer than 1,200 units will be needed to serve the 3,070 counties of the United States and their contained cities, whereas at the present time some 18,000 jurisdictions essay to perform this service in town, township, village, city, county, city-county, or multi-county units, ranging in population from eight persons to seven and a half million.

---

\* Recommended Qualifications for Public Health Nursing Personnel, 1940-1945. Committee on Professional Education, A.P.H.A. and Education Committee, N.O.P.H.N. *A.J.P.H.*, 32, 7:748 (July), 1942.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.  
All books reviewed in these columns may be purchased through the Book Service.*

**Bacteriology and Allied Subjects**  
—By Louis Gershenfeld. Easton, Pa.: Mack Publishing Co., 1945. 561 pp. Price, \$6.00.

This volume is derived from works previously published under the title "Bacteriology and Sanitary Science" by the same author, but the name has been changed to "Bacteriology and Allied Subjects" as being "all-inclusive." The reader is expected to have a working knowledge of the subjects discussed. No attempt has been made to correlate available information and to bring it together with the fundamentals of bacteriology into one text. The volume is the result of the author's own need for a teaching and reference text. The selection of material is broad and is intended primarily for students of pharmacy.

The Table of Contents includes, in addition to standard bacteriological topics like history and scope of the subject, characteristics, methods of study, cultivation and classification of bacteria, etc., such headings as Flatworms, Roundworms, Arthropods, Rodents, Snakes and Higher Animals, Insect Extermination and Insecticides, and Fumigation. The section on biological products is rather detailed and reflects the author's interest and long study in that field (45 pages). The discussion of disinfection and sterilization is also unusually detailed and complete, covering 60 pages. Other topics are much less extensively dealt with, for example, Antibiosis, Bacteriotherapy, Penicillin, Gramicidin and Phagotherapy (7 pages total). Diseases of unknown, doubtful or indefi-

nately determined etiology (including scarlet fever and yellow fever, rabies, smallpox, dengue, rheumatism, and 30 other diseases), 23 pages in all. Thus, the selection and balance of consideration of material is not entirely conventional, as pointed out by the author who "included certain information not found in most textbooks of bacteriology but which is of value for those for whom this volume is intended."

The arrangement is probably convenient for the author's purposes but seems to lack unity for the ordinary reader. In general, the treatment is brief but encyclopedic. References to original papers and other literature are given in the text. There are only about a dozen illustrations, and charts and diagrams are rare or absent. The table of contents is very extensive and there is a well constructed index.

MARTIN FROBISHER

**Mass Miniature Radiography of Civilians**—By Clark, Hart, Kerley, and Thompson. London: His Majesty's Stationery Office, 1945. 135 pp. Price, \$.90.

This volume consists of a detailed report of a mass radiographic 35 mm. survey conducted for research purposes on four selected civilian population groups of, approximately 23,000 persons in Greater London, including two factories, an office group, and a mental hospital.

Technical and administrative problems arising in connection with civilian mass radiography are discussed in minute detail in Part I. The development and acceptance of the Morgan

phototimer has modified the whole procedure of mass miniature radiography to such an extent that much of the material covered, including the necessity of a large operating team, can be eliminated in future survey work. The employment of a permanent team of eight members for examining 1,500 persons per week appears excessive by American standards.

Part II contains the statistical results of the 1943 survey by one experimental unit, with an excellent discussion of associated epidemiologic and control problems. Reliable estimates are given of the incidence of pulmonary tuberculosis during wartime in various civilian groups, with estimates of the demands likely to be made on tuberculosis services by mass radiography.

A worth while suggestion is made for a simple administrative classification in mass radiography in order to facilitate comparison of results internationally. Caution must be exercised, however, in the separation of "observation" and "treatment" cases, and should not be based on a single chest x-ray film examination alone.

The results of laryngeal swab cultures as a simple bacteriological procedure following mass radiography warrant more extensive investigation and use of this technique in this country. A supplementary report on the re-investigation of one of the factory groups at the end of a year is briefly presented, illustrating the general experience that subsequent routine surveys produce fewer cases than initial surveys.

The survey was purposely limited in size and scope so that much experimentation could be done. With greater experience, further simplification of technique and administrative procedure will undoubtedly follow. The exhaustive analysis of accurately collated data is clearly presented and well worth reading. HERMAN E. HILLEBOE

*The March of Medicine, Lectures to the Laity, 1944—New York Academy of Medicine. New York: Columbia University Press, 1945. 121 pp. Price, \$1.75.*

The book entitled "The March of Medicine"—a publication of the annual series of lectures to the laity of the New York Academy of Medicine is of considerable interest to those in the public health field as well as to intelligent laymen who wish to be informed about the newer developments in medicine.

The lecturers come from widely diversified fields and, while the subjects are equally diversified, they form a pattern of developments that have affected the lives of many during the last few years.

The series begins with a contribution of Edward A. Strecker in a discussion of morale and propaganda. He recalls to the reader the oft-forgotten fact that it is impossible to understand a nation by its material measurements—its machines and gadgets and wealth. The spirit of man is that which counts, he says, and the mental health of the nation is dependent upon the spirit.

Charles Glen King reviews the advances made by science in the cause of better nutrition and presents the yardsticks so far developed for measuring adequate nutrition. This contribution is of great importance in the face of changing diets brought about by food shortages caused by the war.

Chemotherapy, even if vaguely understood, has become everyday conversation in remote parts of the country. Colin M. McLeod describes the body processes through which chemotherapy becomes valuable in attacking certain diseases, and illustrates the careful scientific research employed before certain of the so-called "wonder drugs" are released for use.

*Medicine and a Changing World* was presented by Reginald Fitz who says

that medicine is not a monopoly and that "if the public has ideas connected with medicine, doctors must be receptive to such ideas as are reasonable," if the national health is to be improved.

Sir Gerald Campbell in an engaging manner relates the effect of science on the lives of human beings and cautions that the machine is the instrument of man and will serve him only as his intelligence is employed in its use.

From the Medical Corps of the United States Army, Thomas T. Mackie contributes a discussion of the control of epidemics during wars and he concludes that, while these wars bring loss of life and untold miseries, from them have come advances in the science of medicine.

This book, small in size, is one of the contributions of American medicine to health education.

MARY P. CONNOLLY

**Introduction to Parasitology, With Special Reference to the Parasites of Man—***By Asa C. Chandler, Ph.D. (7th ed.) New York: Wiley, 1944. 716 pp. Price, \$5.00.*

The 7th edition of this book is as stimulating, accurate, and interestingly written as the first edition which the reviewer used some 20 years ago in his first course in parasites and human disease. The book has grown considerably in its various editions and includes not only the usual metazoan parasites of man but considers rickettsial diseases, the filterable viruses, and diseases due to spirochetes. There is also an extensive section on arthropods and disease. Although the life cycle, anatomy, treatment and prevention of the various parasitic forms are given in detail, the broader problems of parasitic existence and general human implications of parasitic diseases are developed with the understanding that is the result of Dr. Chandler's broad biological experience. Much of the

material in the book is the result of his firsthand observations in the field and laboratory.

This book is written primarily for college students. It is, however, so complete and up-to-date that the medical and public health professions will find it of great value. The book is written in a stimulating, readable style and the author frequently takes one behind the scenes, as for example in the microfilaria periodicity controversy, "For blow by blow accounts of this contest, see Hinman, 1937, and Lane, 1937."

HAROLD W. BROWN

**Approved Laboratory Technic—***By John A. Kolmer and Fred Boerner. (4th ed.) Philadelphia: Appleton-Century, 1945. 1017 pp. Price, \$10.00.*

The new fourth edition of this valuable book "has been heavily revised, largely rewritten, and considerably enlarged by the inclusion of newer methods and new illustrations." It presents in concise form, usually in numbered steps, the technic of a very great number of methods used in all of the fields embraced in the most comprehensive modern laboratory. Such recent innovations as the assay of penicillin in body fluids and the auto-hemagglutination test for primary atypical pneumonia are included. As a reference book for the technic of methods infrequently used and for the refinement and improvement of routine procedures it should be invaluable in every laboratory dealing with clinical diagnostic problems.

The sections dealing with communicable disease bacteriology suffer to some extent from too great a simplification, for instance there is no discussion of the antigenic analysis of the *Salmonella* or *Shigella* groups; methods for the transportation of material for cultures of *Neisseria gonorrhoeae* are omitted as being unsatisfactory; and no mention is



made of the Vi antigen of *Eberthella typhosa* nor of serum antitoxin titrations for diphtheria immunity.

In addition to the methods of Kolmer and of Boerner for the serodiagnosis of syphilis, the methods of Eagle, Hinton, Kahn, Kline, and Mazzini are described in detail, but no mention is made of the verification tests considered so important by Kahn.

The bacteriological examination of milk and water is covered in two 5 page chapters stated to be adaptations of the methods of the American Public Health Association. However, the section on milk directs pouring plates with nutrient agar of pH 6.6 and incubation at 37° C., failing to mention either T.G.E.M. agar or incubation at 32° C., while the section on water fails to mention liquid confirmatory media, material which has been included in *Standard Methods* for the past several years.

These criticisms are not meant to detract from the general usefulness of the book, especially in the fields designated by Kolmer as clinical pathology and clinical chemistry. It has a definite place in every public health laboratory.

EDMUND K. KLINE

**Directory of Social Agencies in the City of New York, 1944-45—Prepared under the direction of the Committee on Information Services of the Welfare Council.** New York: Columbia University Press, 1944. 366 pp. Price, \$4.00.

The 45th edition of this directory has recently been issued under the auspices of the Welfare Council of New York. Started in 1883 by the Charity Organization Society when this society was the social work pioneer in the city, it was taken over by the Welfare Council as a coöperative undertaking by all social agencies of the city in 1935. Since then the *Directory* has been pub-

lished biennially. It has a wide usefulness, the agencies being listed both alphabetically and in classified sections in relation to type of service given. National agencies with headquarters in the city are included as well as local agencies. Appended also is a list of directories useful to the social worker.

Because of the paper shortage the alphabetical listing of executives of social agencies, hitherto included, is omitted in this edition.

Provision is made for keeping the information in the *Directory* currently up-to-date by publishing changes of personnel, addresses, and telephone numbers in *Better Times*, the weekly publication of the Welfare Council.

MARTHA LUGINBUHL

**School's Out. Child Care Through Play Schools—By Clara Lambert.** New York: Harper, 1944. 225 pp., illus. Price, \$2.50.

Anyone who has watched the "Play Schools" in action or who has watched the development of the work of the association which promotes them throughout the nation will be particularly interested in seeing this volume and having it to pass along. For the book is full of facts, sketches of equipment, helpful suggestions for children's activities, for training staff, for working with parents. Those who must plan for those after-school hours when many children today have no backyard where mother keeps a watchful eye, will find much in these pages to help them—and learn of successful ventures in many parts of the country. But those who do not need to plan for such activities can learn much from this book about what children from 5 to 14 are like, what play means to them, what play can do for them, and how to let them play.

LEONA BAUMGARTNER

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Something Not To Crow about—**  
In 1943 there were 389 outbreaks of water, milk, or food-borne diseases affecting 23,665 victims.

ANON. Outbreaks of Disease in the United States during 1943 Transmitted by Water, Milk, and Milk Products, and Other Foods. Pub. Health Rep. 60, 18:485 (May 4), 1945.

**What To Do To Be Saved—**  
Though this exhortation is addressed to nurses, there is scarcely a word in it that you can't apply to your own particular job. The exhorter, who knows his business, says in effect, "Many of you think the problems that face your profession, particularly the negative attitude of the public toward you, can be solved by putting pieces and pictures about you in the papers, and having radio commentators say nice things about you. "Public relations," he adds, "is not that kind of magic."

BERNAYS, E. L. A Public Relations Viewpoint. Am. J. Nurs. 45, 5:351 (May), 1945.

**Centennial—**In the sixth year of her reign (1843), Queen Victoria appointed a commission to inquire "into the present state . . . of the public health and the condition of the poorer classes. . . ." The excerpts from these two reports of the insanitary conditions unearthed in the "large towns and populous districts" will provide you with many a fine quotation for future orations.

DAVIES, T. A. L. One Hundred Years of Public Health. Pub. Health. 58, 7:75 (Apr.), 1945; (and) WHITEHEAD, H. C. One Hundred Years' Progress in Sanitation in Great Britain. J. Roy. San. Inst. 65, 2:65 (Apr.), 1945.

**Especially When Faces Are Bitten—**Animal experiments warrant

a trial of immune serum and vaccine in the prophylaxis of rabies in man. It seems reasonable to assume that the serum may prevent the passage of the virus from nerve cell to nerve cell.

HABEL, K. Seroprophylaxis in Experimental Rabies. Pub. Health Rep. 60, 20:545 (May 18), 1945.

**For Industrial Workers—**For fifty cents a week the workers in the Kaiser shipyards get comprehensive coverage for non-industrial accidents and illnesses. Family memberships are gradually being made available. In January, 1943, only .62 per cent of the members had joined the plan. In August, 1944, more than 92 per cent had signed up. Health and disease prevention are stressed.

KUH, C. The Permanente Health Plan. Indust. Med. 14, 4:261 (Apr.), 1945.

**Foetal Erythroblastosis—**Here is one city health department laboratory which performs Rh factor determinations on antepartum blood specimens. The Maternal Welfare Committee of the County Medical Society asked for the service and the community's obstetricians are pleased with it.

LEE, F. P., *et al.* The Rh Factor and the Public Health Laboratory. J.A.M.A. 128, 1:19 (May 5), 1945.

**"Health for the American People"—**You must read the Surgeon General's address at the dedication of the Health Institute of the United Automobile Workers, CIO. Briefly, the six goals of a comprehensive national health program are outlined. "We cannot attain these goals by talking about them," he reminded his audience.

"We must plan, and if necessary, fight for them."

PARRAN, T. Over the Horizon in Public Health. Pub. Health Rep. 60, 17:457 (Apr. 27), 1945.

**Research's Forgotten Man**—Ten years ago the Tice Laboratory and Clinic set about determining whether BCG is safe and, vaccination with it, beneficial. "It may be concluded," summarizes the report, "that in the first seven years of life BCG vaccination is of definite value in the prevention of tuberculosis."

ROSENTHAL, S. R., *et al.* Ten Years' Experience with BCG (experimental and clinical). J. Pediat. 26, 5:470 (May), 1945.

**Cross and/or Shield**—Four types of relationship exist between medical and hospital plans, varying from no, to complete, coordination between the services for the 16,000,000 who buy prepaid hospital care and the 1,800,000 who purchase some form of prepaid medical care.

REED, L. S., and VAUGHN, H. F., JR. The Coordination of Medical and Blue Cross Plans. J.A.M.A. 128, 1:22 (May 5), 1945.

**After-thoughts on Polio**—Though this paper is largely medicine, and not hygiene, there is some excellent discussion of the natural history of poliomyelitis which should interest all public health workers. Also there is an objective discussion of Sister Kenny's

contribution to the treatment of the disease that should help clear away the effects of some of the ill-tempered noise that we've heard from both camps.

STIMSON, P. M. Treatment of Poliomyelitis. New York State J. Med. 45, 7:744 (Apr.), 1945.

**The Second Horseman**—After the cessation of hostilities in World War I, typhus, relapsing fever, cholera, smallpox, malaria, dysentery, and typhoid swept across Europe. Conditions propitious for epidemics exist now and are likely to grow worse. Louse-borne typhus is the gravest danger, with three main epidemic foci. But other diseases threaten, too. UNRRA's Epidemiologic Information Bulletin will publish later accounts of the status of the epidemic diseases.

STOUMAN, K. The Epidemic Outlook in Europe. J.A.M.A. 128, 3:185 (May 19), 1945.

**More Guns—and Butter**—Services rendered by 47 state industrial health units employing a total professional personnel of 300 make an impressive total. They included inspections and surveys of industrial hazards, recommendations for improvements involving many thousands of laboratory tests and physical examinations.

TRASKO, V. M. Official Industrial Hygiene Services. Indust. Med. 14, 4:277 (Apr.), 1945.

## BOOKS RECEIVED

ANTECEDENTS OF THE NATIONAL TUBERCULOSIS ASSOCIATION. By Robert G. Paterson, Ph.D. New York: National Tuberculosis Association, 1945. Historical Series No. 2. 25 pp. Price, \$25.

THE AUTOBIOGRAPHY OF SCIENCE. Edited by Forest Ray Moulton and Justus J. Schifferes. Garden City: Doubleday, Doran, 1945. 666 pp. Price, \$4.00.

BIBLIOGRAPHY OF THE PUBLISHED WRITINGS OF SIGISMUND SCHULTZ GOLDWATER, M.D. Compiled by the Bacon Library of the

American Hospital Association. Chicago: American Hospital Association. 15 pp. Free from The Bacon Library, 18 East Division St., Chicago 10, Ill.

CAMPING FOR CRIPPLED CHILDREN. Edited by Harry H. Howett. Elyria: The National Society for Crippled Children and Adults, Inc., 1945. 120 pp. Price, \$1.00.

DIAGNOSTIC PROCEDURES AND REAGENTS. Technics for the Laboratory Diagnosis and Control of the Communicable Diseases. American Public Health Association. 2nd

- ed. New York: American Public Health Association, 1945. 549 pp. Price, \$4.00.
- THE DIETARY OF HEALTH AND DISEASE. By Gertrude I. Thomas. 4th ed. Philadelphia: Lea & Febiger, 1945. 308 pp., illus. Price, \$3.50.
- ENGINEERING PREVIEW. An Introduction to Engineering Including the Necessary Review of Science and Mathematics. By L. E. Grinter, Harry N. Holmes, H. C. Spencer, Rufus Oldenburger, Charles Harris, R. G. Kloeffer, and V. M. Faires. Home Study Edition. New York: Macmillan, 1945. 619 pp. Price, \$6.00.
- ESSENTIALS OF BODY MECHANICS IN HEALTH AND DISEASE. By Joel E. Goldthwait, M.D., Lloyd T. Brown, M.D., Loring T. Swaim, M.D., and John G. Kuhns, M.D. 4th ed. Philadelphia: Lippincott, 1945. 316 pp., 128 illus. Price, \$5.00.
- FOOD FOR THE WORLD. Edited by Theodore W. Schultz. Chicago: University of Chicago Press, 1945. 353 pp. Price, \$3.75.
- HEALTH CARE FOR AMERICANS. By C.-E. A. Winslow, Dr.P.H. New York: Public Affairs Committee, 1945. No. 104. 32 pp. Price, \$1.00.
- HEALTH SECURITY IN POSTWAR AMERICA. Summaries of Papers of the Second Wartime Conference on Labor Health Security. By the Health Council Institute Staff. New York: Health Council Institute for Labor Education and Research, 1945. 84 pp.
- HEALTH TEXT-WORKBOOK. An Orientation Course in Personal, Racial, Home and Community Hygiene. By Kathleen Wilkinson Wootten. 4th ed. New York: Barnes, 1944. 212 pp. Price, \$1.50.
- JURISPRUDENCE FOR NURSES. Legal Knowledge Bearing Upon Acts and Relationships Involved in the Practice of Nursing. By Carl Scheffel, M.D., in collaboration with Eleanor McGarvah, R.N. 3rd ed. New York: Lakeside Publishing Co., 1945. 264 pp. Price, \$3.00.
- THE MALE HORMONE. By Paul de Kruif. New York: Harcourt, Brace, 1945. 243 pp. Price, \$2.50.
- MEDICAL CARE AND HEALTH SERVICES FOR RURAL PEOPLE. A Study Prepared as a Result of a Conference Held at Chicago, Illinois, April 11-13, 1944, Sponsored by the Farm Foundation. Chicago: Farm Foundation, 1944. 226 pp. Price, \$1.00.
- MEDICAL CARE OF MERCHANT SEAMEN. A Handbook of Ship and Aircraft Sanitation and Emergency Medical Aid. By W. L. Wheeler, Jr., M.D. New York: Cornell Maritime Press, 1945. 212 pp. Price, \$2.00.
- A MILLION HOMES A YEAR. By Dorothy Rosenman. New York: Harcourt, Brace, 1945. 333 pp. Price, \$3.50.
- NATIONAL HEALTH AGENCIES. A Survey With Especial Reference to Voluntary Associations. By Harold M. Cavins. Washington, D. C.: Public Affairs Press, 1945. 251 pp. Price, \$3.00.
- PERSONNEL WORK IN SCHOOLS OF NURSING. By Frances Oralind Triggs, Ph.D. Philadelphia: Saunders, 1945. 237 pp. Price, \$2.75.
- THE PSYCHOLOGY OF WOMEN. A Psychoanalytic Interpretation. By Helene Deutsch, M.D. Volume 2, Motherhood. New York: Grune & Stratton, 1945. 506 pp. Price, \$5.00.
- PUBLIC MEDICAL CARE. Principles and Problems. By Franz Goldmann, M.D. New York: Columbia University Press, 1945. 226 pp. Price, \$2.75.
- REPORT OF THE CONFERENCE ON THE PROBLEMS OF MEDICAL CARE. WASHINGTON, D. C., DECEMBER 8-9, 1944. New York: Physicians Forum, Inc. 47 pp.
- THE ROCKEFELLER FOUNDATION. A REVIEW FOR 1944. By Raymond B. Fosdick. New York: Rockefeller Foundation. 63 pp. Free from publisher, 49 W. 49th St., New York, N. Y.
- SOCIOLOGY APPLIED TO NURSING. By Emory S. Bogardus, Ph.D., and Alice B. Brethorst, Ph.D. 2nd ed. Philadelphia: Saunders, 1945. 312 pp. 27 illus. Price, \$2.50.
- SWIMMING POOL DATA AND REFERENCE ANNUAL. 13th ed. New York: Hoffman-Harris, Inc., 1945. 110 pp. Price, \$3.00.
- WHAT TO DO ABOUT VITAMINS. By Roger J. Williams. Norman: University of Oklahoma Press, 1945. 56 pp. Price, \$1.00.
- WISCONSIN HANDBOOK ON HEALTH FOR THE ELEMENTARY TEACHER. By the Wisconsin Coöperative School Health Program. Madison: Bureau of Maternal & Child Health, State Board of Health, 1944. 109 pp.
- YOUR HAIR AND ITS CARE. By Oscar L. Levin, M.D., and Howard T. Behrman, M.D. New York: Emerson Books, 1945. 184 pp., illus. Price, \$2.00.
- SCIENCE TODAY AND TOMORROW. By Waldemar Kaempffert. 2nd series. New York: Viking, 1945. 279 pp. Price, \$2.75.
- VITAL STATISTICS DIRECTORY. Compiled by the Vital Statistics Section of the American Public Health Association. 3rd ed. New York: American Public Health Association, 1945. 33 pp. Price, \$.75.

# ASSOCIATION NEWS

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### Health Officers Section

- Lt. Col. C. Earl Albrecht, M.C., Fort Richardson, Palmer, Alaska, Commanding Officer and Post Surgeon
- Clodoveo Alcivar, M.D., Clinica Guayaquil, Guayaquil, Ecuador, S. A., Vice-Director, Instituto Nacional de Higiene.
- Richard W. Garnett, M.D., Health Office, Danville, Va., Director, Danville Health Dept.
- Frank M. Hall, M.D., M.P.H., Box 491, Gainesville, Fla., Director, Alachua County Health Dept.
- Elmer L. Hill, M.D., 41 Exchange Place, Typhus Control Unit, Atlanta, Ga., Passed Asst. Surgeon, U. S. Public Health Service
- Antonio Langis, M.D., D.P.H., Ste. Martine, Chateauguay County, P. Q., Canada, Health Officer
- John W. McClane, M.D., P. O. Box 494, Fernandina, Fla., Director, Nassau-Baker Health Unit
- Norman C. Parfit, D.T.M., D.P.H., Causeway Cottage, Much Hadham, Herts, England, Acting Head, Dept. of Public Health, West China Union Univ. (on leave)
- Ernest R. Pike, M.D., East Woodstock, Conn., Health Officer
- J. Lyle Spelmann, M.D., 2410 H. St., Modesto, Calif., Health Officer, Stanislaus County Health Dept.
- Harley J. Stacey, M.D., 510½ Delaware St., Leavenworth, Kan., County Health Officer and Director, Venereal Disease Control
- Smith L. Turner, M.D., Williston, Fla., Director, Levy County Health Unit
- J. Harvey Venning, 23 Church St., Greer, S. C., Health Officer, Greer Health Zone
- E. M. Watson, M.D., 6 Roberts St., Fargo, N. D., City Health Officer
- W. H. Weeks, M.D., P. O. Box 269, Lexington, Miss., Health Director, Holmes County Health Dept.
- Major Samuel S. Winter, M.C., 948-16 St., Newport News, Va., Public Health Officer, Hampton Roads Port of Embarkation
- William L. Wright, M.D., Bell County Health Dept., Pineville, Ky., Director

### Laboratory Section

- C. Raymond Bitter, M.A., 839-13th St., Boulder, Colo., Instructor in Bacteriology and Public Hygiene, Univ. of Colorado
- Harry E. Bremer, State House, Montpelier, Vt., Supervisor of Creamery Inspection, State Dept. of Agriculture
- John H. Brown, V.M.D., 276 W. Market St., Marietta, Pa., Asst. Director of Laboratories, Wyeth Inc.
- Robert E. Buchanan, Ph.D., 503 Welch Ave., Ames, Iowa, Head, Dept. of Bacteriology, Iowa State College
- Rita Clark, City Laboratory, City Hall, Brockton, Mass., Asst. Bacteriologist
- James M. Darlington, Ph.D., 60 N. West End Ave., Lancaster, Pa., Sr. Bacteriologist, Wyeth Inc.
- Arnold J. Gelarie, M.D., 52 W. 74th St., New York 23, N. Y., Private Practice
- Lt. Thomas H. Hayes, Sn.C., 12th Medical Laboratory, Fort Lewis, Wash., Bacteriologist
- Laura G. Jacques, M.D., 105 Pleasant St., Concord, N. H., Director, Division of Diagnostic Laboratories, State Dept. of Health
- Goswin Karmann, M.S.P.H., Instituto Butantan, Caixa 65, Sao Paulo, Brazil, S. A., Asst. Chemist, Dept. of Immunology
- Francisco Landron, M.S., Ponce de Leon 74, Santurce, Puerto Rico, Bacteriologist, Laboratorio Quimico-Biologico
- Lt. Benjamin Mandel, Sn.C., Laboratory Officer, General Hospital
- Lt. Harvey L. Moss, Fort Totten, N. Y., Chief of Laboratory and Post Medical Inspector
- Ellen R. Nishimoto, Board of Health, Hilo, Hawaii, Biological Laboratory Technician
- Charles C. Prouty, M.S., Troy Hall, State College of Washington, Pullman, Wash., Assoc. Dairy Bacteriologist and Asst. Prof. of Bacteriology and Public Health
- Benjamin J. Rush, Jr., Rt. No. 3, Box 296, Charleston, S. C., Chief Pharmacist, U. S. N.
- Rafael Santiago-Carmona, 216 Ponce de Leon Ave., Santurce, Puerto Rico, Private Practice, Laboratorio, Quimico-Clinico

Harry H. Weiser, Ph.D., Dept. of Bact., Ohio State Univ., Columbus 10, O., Asst. Prof. of Bacteriology

Katharine E. Welsh, 527 Nottingham Rd., Baltimore 28, Md., Principal Bacteriologist, City Health Dept.

Lt. John A. Yurchenco, Laboratory Officer, General Hospital

#### *Vital Statistics Section*

P. K. Whelpton, Scripps Foundation, Oxford, Ohio, Assoc. Director, Research in Population Problems

#### *Engineering Section*

Erdman J. Allen, 323 County-City Bldg., Seattle 4, Wash., Sanitary Engineer, Seattle Water Dept.

H. Fred Baldridge, 720 Locust St., Twin Falls, Idaho, Sanitarian, State Dept. of Public Health

Charles R. Joseph, M.S., Ashford St. No. 9, Guayama, Puerto Rico, Sanitation Officer, Dept. of Health

J. Don Layson, 1710 N. El Dorado St., Stockton 25, Calif., Sanitary Engineer, Naval Supply Annex

Joseph L. Minkin, M.S., 9112 Palmetto St., New Orleans 18, La., Public Health Engineer, U. S. Public Health Service

Peter H. Sakai, M.S.P.H., 3167 Pahoia Ave., Honolulu 41, Hawaii, Sanitary Inspector, Food and Drug Div., Territorial Board of Health

Major John P. Smith, Jr., Sn.C., P. O. Box 152, Balboa Heights, Canal Zone, Sanitary Engineer, Health Dept., The Panama Canal

#### *Industrial Hygiene Section*

Frederick T. McDermott, 18 S. Perry St., Pontiac 15, Mich., Industrial Hygiene Engineer, Bureau of Industrial Hygiene, State Dept. of Health

John T. McDermott, 3728 Avondale Ave., St. Louis 20, Mo., Safety Engineer, U. S. Cartridge Co.

Charles J. Menard, 35 Polk St., San Francisco, Calif., Member, Structural Pest Control Board, State of California

William L. Wilson, State Dept. of Health, New Orleans 7, La., Industrial Hygiene Chemist, U. S. Public Health Service

#### *Food and Nutrition Section*

Luis A. Blanco, Calle 63A No. 17-29, Bogota, Colombia, S. A., Student of Public Health, Yale Univ.

Joseph Buteau, M.D., Croix Rouge, Port-au-Prince, Haiti, Vice-President

Anna M. Guerriero, 62 Milford St., Hartford,

Conn., Case Supervisor, Hartford Dept. of Public Welfare

Santo J. Sorbello, 5311a Magnolia Ave., St. Louis 9, Mo., Sanitary Inspector in charge of Food Handler Training, St. Louis Health Div.

#### *Maternal and Child Health Section*

Matthew Arnao, M.D., 162 Atkins Ave., Brooklyn, N. Y., Practicing Physician

Ann Martin, M.D., Children's Hospital, East Bldg., San Francisco, Calif., Director of Child Development Center

Israel Miller, M.D., 1014 Lenox Rd., Brooklyn, N. Y., Supervising Physician, New York City Dept. of Health

#### *Public Health Education Section*

Elin L. Anderson, M.A., Farm Foundation, 600 S. Michigan Ave., Chicago 5, Ill., Director, Medical Care and Health Services for Rural People

Prudence Appelman, R.N., Jameson Memorial Hospital, New Castle, Pa., Director of Nursing

Gladys Bradley, M.A., 922 Woodlawn Ave., Ann Arbor, Mich., Student, Univ. of Mich. Venerable William F. Bulkley, D.D., 75 P. St., Salt Lake City, Utah, Pres., Utah Social Hygiene Assn., Inc.

George H. Craze, 4th Floor, Court House, San Antonio 5, Tex., Exec. Secy., Bexar County Tuberculosis Assn.

Doris B. Gehrke, 763 Chapel St., New Haven, Conn., Exec. Secy., Employers Tuberculosis Relief Assn.

Mary R. Gillette, 140 Clarendon St., Boston Y.W.C.A., Boston, Mass., Director, Dept. of Health Education

Opal C. Hartline, Ph.D., M.P.H., 209 S. Campbell St., El Paso, Tex., Director of Public Health Education, El Paso City-County Health Unit

Billie Vliet Keefe, 1025 Stahlman Bldg., Nashville 3, Tenn., Exec. Secy., Tennessee Society for Crippled Children Inc.

Janice J. Lerner, 138 S. Oak Knoll Ave., Pasadena, Calif., Supervising Medical Social Worker, Los Angeles County Health Dept.

Jo Ann Lewis, 106½ N. 14th St., Herrin, Ill., Health Education Representative, Williamson County Health Dept.

Naomi H. Malkin, 246 West End Ave., New York, N. Y., Student, Yale Univ.

John C. Potkay, Boston Post Road, R. D. No. 2, New London, Conn., Graduate Student, Dept. of Public Health, Yale Univ. School of Medicine

Alberta Quinif, R.N., Box 164, Kittanning, Pa., Exec. Secy., Armstrong County Tuberculosis and Health Society

LaPrele M. Ridd, 504 South 6 West, Brigham, Utah, Interested Citizen  
 Marion Souza, M.A., Dept. of Education, Baton Rouge, La., Supervisor, School-Community Health Projects, State Dept. of Education  
 Lois G. Whitley, 525 Morgan St., Joliet, Ill., Health Educator, Will County Health Dept.

#### *Public Health Nursing Section*

Mattie Brass, R.N., Box 270, Spencer, Ia., Supervising Nurse, Health District 3  
 Regine M. Ferguson, 2520 Broadway, Little Rock, Ark., Acting Chief Nurse, City Health Dept.  
 Helen Fisher, 304 City Hall, Portland, Ore., Supervisor of Nurses, Div. of School Hygiene, Bureau of Health  
 Kate O. Hyder, M.A., 1336 S. Newberry Ave., Chicago, Ill., Director, Nursing Service, Chicago Maternity Center  
 Velma G. Long, R.N., 1325 Garfield, Topeka, Kan., Consultant, Kansas State Board of Health  
 Anna M. Matter, R.N., 907 National Reserve Bldg., Topeka, Kan., Public Health Nurse, Tuberculosis Control Div., State Dept. of Health  
 Leada L. Neining, 400 Howard St., Bridgeport, O., District Supervisor of Public Health Nursing, State Health Dept., Charleston, W. Va.  
 Ruby S. Sandall, Box 231, Tremonton, Utah, Public Health Nurse  
 Anna C. Scholl, M.N., Jacksonville, Vt., Public Health Nurse, State Dept. of Public Health  
 Mary G. Woodward, R.N., District Health Office No. 2, Sikeston, Mo., Field Advisory Nurse  
 Agnes W. Stirling, U. P. & L. Station, Collinston, Utah, Public Health Nurse

#### *Epidemiology Section*

Fred C. Bishopp, Ph.D., 8014 Piney Branch Rd., Silver Spring, Md., Asst. Chief of Bureau in charge of Research, Bureau of Entomology and Plant Quarantine, USDA  
 Mary C. Block, M.D., 1615 N. Broadway, Santa Ana, Calif., Director, Orange County Tuberculosis and Health Assn.  
 Helen M. Bradley, R.N., 3333 Grand Ave., Apt. 296, Des Moines, Ia., Record Analyst, U. S. Public Health Service  
 Enrique Figueroa Franqui, M.D., M. Gomez 29, Santa Clara, Cuba, Medico Honorario del Hospital de Maternidad de Sta. Clara y Jefe del Departamento de Medicina Preventiva de la Cruz Roja en Santa Clara  
 Ensign James R. Patterson, Naval Training

Center, Epid. Unit No. 12, Sampson, N. Y.  
 Major Richard J. Plunkett, M.C., American Embassy, Asuncion, Paraguay, S. A., Chief of Party, Health and Sanitation Division, Institute of Inter-American Affairs  
 Joseph J. Pokay, 127 N. W. 18th Ave., Miami 35, Fla., Sr. Sanitary Officer, Dade County Health Unit

#### *School Health Section*

Helen S. Austin, 3131 Pasadena Ave., Los Angeles 31, Calif., Assoc. Medical Secy., Southern California Conference of Seventh Day Adventists  
 Edna M. Blochberger, 17 East 53 Terrace, Kansas City 2, Mo., Staff Nurse, Board of Education  
 Gertrude T. Huberty, M.D., 405 Hilgard Ave., Los Angeles 24, Calif., Physician for Women, Univ. of California  
 Byron N. Lingeman, M.D., 419 Ben Hur Bldg., Crawfordville, Ind., School Physician  
 Nancy E. Lutz, 1206 Greenridge Rd., Jacksonville 7, Fla., Consultant in Health Education, Board of Public Instruction  
 Rosanna N. McKenney, M.D., 804 Elm St., Winnetka, Ill., School Physician  
 W. Tate Robinson, P. O. Box 2360, Honolulu 4, Hawaii, Director of Health Education, Dept. of Public Instruction  
 Gladys Simonds, M.A., 1618 Watava Rd., Toledo, O., Teacher, Harvard School  
 Lloyd L. Tate, M.D., 1520 S. Grand, St. Louis, Mo., Director of Health and Hygiene, St. Louis Public Schools  
 Elizabeth D. Thomas, R.N., B.S. in N.Ed., 413 N. Walnut St., West Chester, Pa., School Nurse, The Chester County Schools  
 Delpha H. White, R.N., Pine Haven, Park Rapids, Minn., School Nurse, Park Rapids Public Schools

#### *Dental Health Section*

W. L. Beal, D.D.S., Anaconda, Mont., Chairman, Montana Council on Dental Health  
 Jose M. Gonzalez-Cepeda, D.D.S., 197 Ponce de Leon Ave., Santurce, Puerto Rico, Dental Service Dept., City of San Juan  
 Norman F. Johnson, D.D.S., Rutland, Vt., Practice of Dentistry  
 Joseph H. Kauffmann, D.D.S., 27 E. 95th St., New York 28, N. Y., Dentist  
 Dr. Bruce Kurtz, 627-1st Trust Bldg., Pasadena 1, Calif., Chairman, Council on Dental Health, Southern Calif. State Dental Assn.

#### *Unaffiliated*

Dr. Anibal Ardila-Duran, National Box 2977, Bogota, Colombia, S. A., Visiting Doctor to the Dept. of Coordinating Services of

National Hygiene, Ministry of Work, Hygiene and Social Welfare  
LaRue O. Ence, 665 Browning Ave., Salt Lake City 5, Utah, Secy., Div. of Industrial Hygiene, State Dept. of Health  
Earl H. Fewell, Dispensary, Navy Yard, Philadelphia, Pa., Sanitary Inspector  
Sylvia Heymann, M.D., M.S.P.H., 1388 Tuckerman St., N.W., Washington 11, D. C., Medical Officer, U. S. Civil Service Commission  
Luisa Iglesias de Jesus, M.A., Cruz 21, Apt. A1, San Juan, Puerto Rico, Medical Social Work Supervisor, Bureau of Medical Social Service, Insular Health Dept.  
Charles K. Petter, M.D., 2400 Belvidere St., Waukegan, Ill., Superintendent and Medical Director, Lake County Tuberculosis Sanatorium

Margaret M. Wilson, 797 N. Van Buren St., Milwaukee 2, Wis., Secy., Health Div., Milwaukee County Community Fund and Council of Social Agencies

#### DECEASED MEMBERS

George R. Bedinger, M.A., Plainfield, N. J., Elected Member 1943, Public Health Education Section  
Joseph H. Humphrey, M.D., St. Louis, Mo., Elected Member 1925, Maternal and Child Health Section  
James B. Vaughn, M.D., Castlewood, S. D., Elected Member 1934, Health Officers Section  
Stafford M. Wheeler, M.D., Bethesda, Md., Elected Member 1939, Elected Fellow 1942, Epidemiology Section

#### WANTED: BACK ISSUES OF THE AMERICAN JOURNAL OF PUBLIC HEALTH

Again the Central Office is sending out an SOS for *Journals* that are out of stock and which are especially needed now to complete sets for the countries that have been occupied and which now are requesting help in rebuilding their technical libraries. The *Journals* that can be used for this purpose are listed below:

1941—January, April, July, August

1942—January, March

1943—January, March, August, September, October, November, December

1944—June, August

1945—January, February, March, April

Members who can return any of the above *Journals* to the A.P.H.A. are requested to do so collect.



## AMERICAN PUBLIC HEALTH ASSOCIATION

Statement of Financial Condition  
as of December 31, 1944

## GENERAL FUND

<i>Assets</i>		
Cash—Treasurer's, Secretary's and Emergency Accounts.....	\$61,108.03	
Accounts Receivable—Sales of Publications, Advertising .....	4,539.15	
Inventories—Publications, Paper for Journal.....	2,182.74	
Advanced on Travel, Postage and Petty Cash .....	1,456.98	
Investment Securities (Book value) .....	24,782.21	
<b>TOTAL GENERAL FUND ASSETS .....</b>		<b>\$94,069.11</b>
<i>Liabilities</i>		
Accounts Payable .....	\$ 5,600.25	
Accrued Expenses and Federal Withholding Tax.....	3,115.00	
<i>Reserves</i>		
Doubtful Accounts Receivable .....	\$ 110.87	
Rebates to Affiliated Societies .....	3,739.50	
Unexpended Balances on Grants .....	10,136.45	
Equipment and Repair Reserve .....	1,712.30	
		15,699.12
<i>Prepaid Income</i>		
Membership Dues—1945 .....	\$20,565.96	
Subscriptions to Journal .....	7,059.16	
		27,625.12
<b>TOTAL GENERAL FUND LIABILITIES .....</b>		<b>\$52,039.49</b>
Net Asset Value—General Fund .....		\$42,029.62
Net Asset Value—Endowment Fund .....		9,796.50
Net Asset Value—Life Membership Fund .....		22,787.50
Net Asset Value—Sedgwick Medal Fund .....		1,290.14
<b>TOTAL NET ASSET VALUE as of December 31, 1944 .....</b>		<b>\$75,903.76</b>

Statement of Income and Expense for the  
Year Ended December 31, 1944

<i>Income</i>		
Membership Dues .....	\$ 54,007.23	
American Journal of Public Health .....	39,827.82	
Publications .....	16,094.55	
Annual Meeting .....	17,764.50	
Field Surveys .....	3,707.77	
Miscellaneous .....	4,035.05	
Grants: Special Activities .....	74,953.99	
<b>TOTAL INCOME .....</b>		<b>\$210,390.91</b>
<i>Expenses</i>		
General Services .....	\$ 38,558.45	
Promotion and Extension .....	11,692.21	
Membership and Subscriptions .....	12,633.23	
American Journal of Public Health .....	33,017.96	
Publications .....	14,633.51	
Annual Meeting .....	7,357.37	
Standing Committees and Special Activities .....	85,460.79	
<b>TOTAL EXPENSES .....</b>		<b>\$203,353.52</b>

In my opinion, the above fairly presents the financial condition of the Association at December 31, 1944, and the results of the operations for the year ended on that date.

(Signed) **FREDERICK FISCHER, JR.**  
Certified Public Accountant

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

### POSITIONS AVAILABLE

(Supplemental to lists in recent Journals).

**Wanted:** Two engineers for Industrial Hygiene Service of Tennessee. Four different starting salaries between \$2,364 and \$3,900 depending on training and experience. Car furnished. Positions permanent. Opportunity for advancement. Apply Dr. R. H. Hutchinson, Commissioner of Health, Nashville 3, Tenn.

**Wanted:** Physician, Division of Child Hygiene, Ohio Dept. of Health. Salary \$4,200. Must be graduate of approved medical school, have 1 year's internship and at least 1 year graduate training, plus 1 year of training or experience in clinical pediatrics or obstetrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Dept. of Health, State Departments Bldg., Columbus 15, Ohio.

**Positions open:** District and County Health Officers in Florida. Medical degree required. Write or wire Merit System Supervisor, State Board of Health, Gainesville, Fla., for complete information.

**Physician wanted:** Public health pediatrics and epidemiology in large California County Health Department. Major duties consist of infant and pre-school health conferences, school examinations, and epidemiology. Beginning salary \$455 per month, plus travel allowance, and one meal a day. California license required. Training, experience in pediatrics or public health desirable. Immediately available. Apply William C. Buss, M.D., Kern Co. Health Dept., Bakersfield, Calif.

Bureau of Tuberculosis, Board of Health, Territory of Hawaii, seeks Biometrician or Statistician. Position will probably be classified under Territorial Civil Service as CAF-8 with salary of \$244.59 plus wartime bonus of \$50 and yearly increment of about \$192 up to 5 years. Bureau of Tuberculosis is also looking for young physician experienced

in tuberculosis work to have immediate charge of active case finding survey program now under way. This position classified under Territorial Civil Service as P-5 with salary of \$416.67 plus \$50 wartime bonus and yearly increment of about \$250 up to 5 years. Apply Robert H. Marks, M.D., Director, Bureau of Tuberculosis, Territorial Board of Health, Honolulu, T.H.

**Wanted:** Bacteriologist with B.S. or M.S. degree, preferably male, to teach student nurses, 45 hour course twice a year, to assist with teaching of second year medical students and do general laboratory work. Salary \$2,000 with option of complete maintenance for \$25 per month. Apply Dr. R. J. Schenken, Director, Dept. of Pathology and Bacteriology, Louisiana State University School of Medicine, New Orleans 13, La.

**Wanted:** Physician to assume directorship, Bureau of Venereal Diseases, in eastern city of 185,000 population. Permanent position. Minimum salary \$4,657, maximum \$5,197.37, includes cost of living adjustment. Travel allowance. Apply Box J, Employment Service, A.P.H.A.

**Sanitary Engineering positions open** with Oregon State Board of Health. Associate engineer \$275-\$325; assistant engineer \$250-\$300. Engineering degree and professional experience required. Sanitarians also needed, salary \$225-\$275. Applications and further information obtainable from the Merit System Council, 616 Mead Bldg., Portland 4, Ore. Apply by August 1.

Excellent opportunities, permanent tenure, for doctors, dentists, nurses, technicians with the Oregon State Board of Health in specialized fields. For information write Merit System Council, 616 Mead Bldg., Portland 4, Ore.

**Wanted:** Laboratory worker, must have at least B.S. degree, for general bacteriological, microscopic and chemical

work (permanent) in laboratory specializing in dairy, food, and bactericide control. Detail training, experience, availability, salary required and references; also send personal data and recent photograph. New Jersey Dairy Laboratories, 222-226 Easton Ave., New Brunswick, N. J.

**Wanted: Immediately:** Veterinarian for Columbia County Department of Health. Salary—maximum \$3,600 per year plus automobile and up-keep. Veterinarian must be licensed in New York State. Address Dr. Sue H. Thompson, 612 Warren Street, Hudson, N. Y. Position for the duration of the war.

**Wanted:** Sanitarian and dairy inspector for field work. Salary \$2,400 per year plus \$5 per day for living expenses. Auto with gasoline and all other expenses furnished. Apply E. J. Ward, Commissioner of Agriculture, State Dept. of Agriculture, Cheyenne, Wyoming.

**Wanted:** City Health Services direc-

tor for city health department in California, city of 100,000 population. Pediatrician or public health trained physician to administer program, serve as clinician in child health conferences and supervise nursery school health program. Salary up to \$6,300 per annum, plus travel. Send complete details and photograph to Box I, Employment Service, A.P.H.A.

**Wanted:** Public health officer in well established health department in county of 68,000 population. Salary \$5,500. Apply Floyd O. Prunty, Chairman, Marion Co. Lay Health Committee, 300 Second St., Fairmont, W. Va.

**Executive Secretary Wanted.** Applicant must have some specialized training and experience in health education. Executive experience desirable. Salary \$3,000 up, depending upon qualifications. Car furnished. Apply with full information to A. C. Martin, M.D., Nassau Co. Cancer Committee, 1551 Franklin Ave., Mineola, N. Y.

### POSITIONS WANTED

Health educator, Ph.D., Harvard, with training in medical science, public health and education, experienced as teacher, seeks position in Northeastern United States. H-512

Health educator, Master of Science in Public Health Education, with experience in visual aids, would like position with private agency in Southwest or Central West. H-514

[END OF A.P.H.A. LISTING]

## Opportunities Available

### Advertisement

**WANTED—**(a) Physician with tuberculosis or administrative experience in public health work; position chiefly concerned with administration and state-wide tuberculosis control program; East. (b) Physician to engage in public health pediatrics with epidemiology; major duties consist of infant and preschool health conferences, school examinations, and epidemiology; county health department, headquarters in town of 80,000 located approximately midway between Los Angeles and San Francisco. (c) Director of student health; state university; approximately 1,800 students, 172 faculty; well equipped infirmary given to university as special gift; East. (d) Young woman physician for student health appointment; competent medical clinician interested in student health work as career required; duties include responsibilities for preventive and acute medicine as well as for hygiene and public health lecturing; Middle West. (e) Public health physician to direct county health department; well equipped department, staff of twelve assistants; progressive program having support of entire community; town of 30,000; Southeast. (f) Assistant director of school health work; school population ap-

proximately 62,000 in 72 public schools; Southwest. **PH7-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED—**(a) Several dentists for public health appointments in South; would be assigned to one or more counties to provide dental care for indigent children and prenatal patients. (b) Two dentists, department of health, public schools, town of 100,000; Middle West. **PH7-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED—**(a) Assistant professor, department of bacteriology and public health, state college; bacteriologist with Ph.D. or D.P.H. degree and with research interests in acceptable field required; Pacific Coast. (b) Associate bacteriologist for research in milk and food sanitation; duties include field activities in the various parts of the country conferring with state and municipal authorities; headquarters in Middle West. (c) Bacteriologist; administrative appointment, department of public health; must be qualified to do original research as well as to supervise investigative work; East. **PH7-3** The Medical

Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Vital statistician; bachelor's degree with year of professional graduate training leading to master's degree or Certificate in Public Health with specialization in general and public health statistics preferred; large industrial project; South. (b) Health educator; state tuberculosis association; \$2,800–\$3,000; East. (c) Social research analyst; state-wide program for physically handicapped children; several years' supervisory experience in conduct of public health or public welfare statistical research activities required; Middle West. **PH7-4** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Nutritionist and, also, nutrition consultant; public health program recently inaugurated in one of the United States dependencies; considerable traveling; salaries \$225–\$255 and \$275–\$320 respectively. (b) Public health nutritionist; city department of health; South. **PH7-5** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Orthopedic nursing consultant; duties consist of supervising public health nursing and orthopedic nursing; state-wide program for physically handicapped children; Middle West. (b) Public health supervisor; county health department having national recognition for its public health achievements; staff of ten nurses; \$2,800. (c) College nurse, experienced in student health work; duties comparatively light, permitting nurse to continue studies; Pacific Northwest. (d) Public health nurse particularly interested in maternity and child health; interesting supervisory appointment with maternity center now being inaugurated by university. (e) College nurse qualified in laboratory work and, also, qualified to teach biology and chemistry; coeducational college expecting detachment of Army for training; duties, therefore, include serving as nurse to Army unit; town of 30,000 not far from Chicago. (f) Instructor, public health nursing; 500-bed hospital; vicinity, New York City. (g) Several nurses for industrial dispensary; large industrial company; \$200; South. **PH7-6** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

## Situations Wanted

### Advertisement

**YOUNG DENTIST**, veteran World War II, is available; B.S. and D.D.S. degrees; two years' successful private practice; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**BACTERIOLOGIST**; B.Sc., M.Sc., and D.Sc. degrees; several years, director of research institution; past ten years, bacteriologist and epidemiologist large organization, during which time he served as associate professor of bacteriology and immunology; for further information covering qualifications including bibliography, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**PUBLIC HEALTH PHYSICIAN** is available; Doctor of Medicine and Doctor of Public Health degrees, state university; sixteen years' administrative experience in public health medicine; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**PUBLIC HEALTH NURSE**; B.S. degree in education; certificate in public health nursing from state university; several years, public health nursing with state department; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

"Four Roads of Public Health" was the theme of the address of Milton J. Rosenau, M.D., President-elect of the American Public Health Association, guest of honor and chief speaker at the Ninth Annual Meeting of the Public Health Association of New York City on May 17.

At an afternoon session, a Panel was conducted on the fields of public health offering the most fruitful promise of expansion. Participating in the Panel were Arthur I. Blau, M.D., Chairman, Otto A. Bessey, Ph.D., Joseph H. Kinnaman, M.D., Jerome S. Peterson, M.D., John L. Rice, M.D., and Clarence L. Scamman, M.D.

The following officers were elected:

*President*—Sol Pincus

*Vice-Presidents*—John L. Rice, M.D., and Helen Crosby

*Secretary-Treasurer*—Frank Kiernan

*To the Executive Board*—Leverett D. Bristol, M.D., Thomas D. Dublin, M.D., Marion V. Fegley, R.N., Henry I. Fineberg, M.D., Alma W. Fraas, Charles A. Freck, Louis A. Friedman, M.D., and Jacob A. Goldberg, Ph.D.

*Representative to the A.P.H.A. Governing Council*—Frank Kiernan

The Association membership is 390.

A message of greeting from the Association was sent to Ernest L. Stebbins, M.D., Health Commissioner, who is on a mission to Europe at the request of the Surgeon General of the U. S. Public Health Service.

### OLEOMARGARINE AND THE COUNCIL ON FOODS AND NUTRITION

Misinterpretation is being placed on the action of the Council on Foods and Nutrition of the American Medical Association in withdrawing acceptance

from individual brands of oleo-margarine. Reports published in the periodicals devoted to the interests of the dairy industry and comment stimulated in the public press falsely attribute this action to a lack of confidence in the nutritional value of margarine. Such is not the case. The report of the Council on Foods and Nutrition in *The Journal*, September 16, 1944, stated clearly that margarine is considered a general purpose food and therefore outside the Council's scope of acceptance, now limited to "special purpose" foods. For this reason acceptance is no longer granted to margarine. Confidence in the nutritional value of margarine fortified with vitamin A was reaffirmed by the Council at the time acceptance was withdrawn. The attempts of those opposing margarine to cast doubt and suspicion on its food value as a result of the withdrawal of acceptance by the Council are unwarranted and misleading. (See *J.A.M.A.*, May 12, 1945.)

### AMERICAN SOCIAL HYGIENE ASSOCIATION ESTABLISHES COMMITTEE ON INTER- AMERICAN COÖPERATION

Surgeon General Thomas Parran, Chairman of the General Advisory Committee of the American Social Hygiene Association, has announced the establishment of a section of the committee for the purpose of furthering coöperation with the other American Republics, and to give recognition, consideration and guidance to the association's activities in this direction. Dr. Ray Lyman Wilbur, the association's President, will serve as Chairman, and Miss Jean B. Pinney, Director of the Washington Liaison Office, as Secretary.

It is believed that the establishment

of the new Advisory Commiteee section will help greatly in further exchange of information and in building of additional friendly relations, as well as in extending the scope of the joint effort for better health and stronger family life in which all are concerned.

#### BIENNIAL CONFERENCE OF THE CANADIAN HOME ECONOMICS ASSOCIATION

The August 27-31 biennial conference of the Canadian Home Economics Association will be held at the Royal Alexandra Hotel, Winnipeg.

#### DIPHTHERIA IN SAN FRANCISCO—1945

J. C. Geiger, M.D., Director of Health of the City and County of San Francisco, has reported that there definitely is an upward trend in the reported incidence of diphtheria for the first part of 1945. From an average of 10 cases per year for the last four years, the prevalence has risen to 28 cases for the first four months of 1945 with 5 deaths. According to Dr. Geiger, 11 of the 28 cases were from the military forces and 10 were in adults ranging from 24 to 72 years. Very few of the cases have been among children previously immunized against diphtheria and none among children immunized and subsequently Schick-tested.

#### U. S. INDIAN SERVICE ANNOUNCES SHORT COURSE IN FOOD HANDLING

Dr. Ralph B. Snavelly, the Director of Health of the U. S. Indian Service, Chicago, has announced that the Indian Service, in coöperation with the U. S. Public Health Service, will offer a short course of instruction in the sanitary handling of food in kitchens and dining rooms maintained by the Indian Service.

Two-day institutes began late in May in Arizona and will be continued beginning June 1 in Phoenix and in

Santa Fe, N. M., Wingate, N. M., and Shiprock, N. M. It is expected that each agency superintendent will detail as delegates a limited number of employees who are responsible for the preparation and serving of food and those responsible for the supervision of this work, including day school personnel, boarding school personnel and hospital and sanatorium personnel.

#### VENEREAL DISEASE AMONG TROOPS OF THE PANAMA CANAL DEPARTMENT

Success in the fight against venereal disease among the troops of the Panama Canal Department is reflected in the annual report for 1944 recently issued by Col. Wesley C. Cox, Department Surgeon and Venereal Disease Control Officer, which shows a new low rate of 2.09 per cent. This rate is less than one-half of the previous annual low of 4.27 established in 1943 and considerably under one-third of the 6.6 per cent recorded in 1940, the first year in which large scale control campaigns became necessary. Contributing to the 1944 record low was a rate of 1.4 per cent attained in the final month of the year. Reports for the first two months of the present year show a still further decline to a rate of 1.8 per cent, which gives army venereal disease control officers a basis for setting the goal for 1945 at 2 per cent or less.

Brig. Gen. Henry C. Dooling, Chief Health Officer, the Panama Canal, and Surgeon, Caribbean Defense Command, acts as liaison officer between the Army and the civil authorities. Co-operation by the Republic of Panama is under the direction of Dr. Guillermo Paredes, Director of Public Health, who works in liaison with General Dooling.

#### UNRRA TO SEND TEACHING STAFF TO CHINA

It was announced in May that the United Nations Relief and Rehabilitation Administration would send about

30 medical and health experts to China to train personnel in medical centers. These persons will be recruited from the United States, Great Britain, Australia, and Canada. Governor General Herbert H. Lehman has announced that essential supplies will also be furnished by UNRRA to equip centers in Chungking and Chengtu and later in Kweiyang, Nanking, and Peiping.

#### NATIONAL HEALTH COUNCIL ELECTION

The National Health Council recently announced the reelection of Eleanor Brown Merrill as *President* for the coming year. Mrs. Merrill is Executive Director of the National Society for the Prevention of Blindness.

Other officers, who were also re-elected, are: *Vice-President*, Dr. Walter Clarke; *Secretary*, Professor Maurice A. Bigelow; *Treasurer*, Dr. William F. Snow.

The National Health Council, with headquarters at 1790 Broadway, New York, N. Y., is a clearing house of 21 voluntary health organizations. As one of its activities, the Council maintains a library of 6,000 volumes and 30,000 pamphlets dealing with public health and related subjects; more than 500 professional journals and technical periodicals are received regularly from all parts of the world.

#### BOARDS NAMED FOR NEW HEALTH DEPARTMENTS IN ILLINOIS

Members of the Boards of Health who will be in command of the new Health Departments in Adams and DuPage Counties were recently appointed by the respective County Boards of Supervisors. These two counties were the first in Illinois to establish their own full-time health departments by popular vote, this action having been taken in the November, 1944, election. In compliance with the Searcy-Clabaugh law under which county health departments are estab-

lished, the membership of each of these County Boards of Health, "chosen for their special fitness for membership on the board," includes two physicians, one dentist, and four other persons. Members of the Adams County Board of Health include Drs. Walter D. Stevenson, Quincy, and Walter E. Davidson, Liberty, and for DuPage County Drs. Carl E. Schultz, Hinsdale, and Arthur S. Webb, Wheaton.

#### SERVICE BUREAU FOR RETURNING MEDICAL OFFICERS IN CONNECTICUT

The organization of a service bureau for returning medical officers is now under way under the auspices of the Connecticut State Medical Society. It will be located and administered in the offices of the state society at New Haven and the Procurement and Assignment Service. Discharged medical officers will have access through the service bureau to factual data concerning opportunities for general or special practice in urban or rural communities, information regarding full-time institutional, public health and industrial employment, and detailed intelligence on the resumption or extension of education and training. Advice and guidance concerning problems of a local nature will be available to the physician veterans at all times. Connecticut physicians who have already returned from military service will be asked to serve the bureau in an advisory capacity in order that the benefit of their special knowledge and experience may be obtained.

#### TROPICAL DISEASES

The State University of Iowa College of Medicine, Iowa City, and the State Department of Health, in coöperation with the U. S. Public Health Service, will conduct a special laboratory course in malaria and other tropical diseases at the State Hygienic Laboratory, Iowa City, July 23-28. The instructors will

be Dr. Milford E. Barnes, Professor of Hygiene and Preventive Medicine, and Kenneth MacDonald, Ph.D., Assistant Professor, both of the College of Medicine, and Dr. Irving H. Borts, Director of the State Hygienic Laboratory.

BUREAU OF INDUSTRIAL HYGIENE  
CREATED IN OHIO

The Cleveland Bureau of Industrial Hygiene has been set up by the local Division of Health to help reduce health hazards in industry. The research and educational facilities of Western Reserve University School of Medicine have been made available to the new bureau, which has established quarters in room 207 at the School of Medicine Building on the university campus, Cleveland. The bureau was established on an order of the Cleveland Welfare Director as a coöperative venture of labor, industry, the medical profession and the public. Herbert G. Dyktor, former Chief Engineer of the Bureau of Industrial Hygiene of the Michigan Department of Health, has been appointed Director. In the immediate future, Mr. Dyktor's staff will consist of two engineers, a chemist, and a secretary.

As a basis for the operation of the bureau, the Division of Health made a survey of 160,000 individuals in Cleveland manufacturing plants to determine their health status and the state of their working environment. The results of the survey have not been tabulated, although some of the more serious industrial health and accident hazards have been found to exist in newer plants that have sprung up since the war, and it is in these plants having fewer than 500 employees where the first work of the bureau will be undertaken. The survey included as one phase the filling out of questionnaires by employees regarding such things as medical examinations, to which they have submitted, whether they have been

examined for tuberculosis and venereal diseases and whether they were examined by a physician before going to work in their present place of employment. It is expected that much of the work of the new bureau will be educational and advisory. It will help plants in obtaining the services of physicians and nurses and in installing proper safeguards. When necessary, it will use police powers of the Division of Health to enforce proper standards, but emphasis will be placed on lectures, movies, pamphlets, and other educational work.

In a statement to the press, Dr. James A. Doull, Professor of Hygiene and Public Health at the medical school, said that medical students will profit by the bureau being situated at the school, and it is hoped that the director of the bureau and members of the staff of the City Division of Health will contribute to instruction of the students. The Bureau of Industrial Hygiene is an outgrowth of the coöperative effort of the Health Subcommittee of the Mayor's War Production Committee, the Anti-Tuberculosis League, the U. S. Public Health Service, the Cleveland Academy of Medicine and Western Reserve University with Dr. Harold J. Knapp, Commissioner of Health of Cleveland.

FIRST HEALTH INSPECTOR GENERAL  
NAMED FOR SOUTH PACIFIC

Dr. John C. R. Buchanan, formerly Deputy Director for Medical Services in Uganda, has been named the first Health Inspector General of the South Pacific in line with a new plan to create a Pacific Public Health Service planned by the British Empire. According to the *New York Times* the decision to adopt the plan, which envisages joint public health and medical services for Fiji, the British Western Pacific territories and New Zealand Island Territories on Oceania was made in conjunction with London and Wellington. It



followed an investigation of existing services in Fiji by New Zealand officials. The headquarters of the set-up will be located in Suva Fiji, which is conveniently situated for training the necessary personnel and for expansion.

#### NATIONAL NURSING PLANNING

Pearl McIver, R.N., chief of the Office of Public Health Nursing, Bureau of States Services, U. S. Public Health Service, and chairman of the Council of Federal Nursing Services, is new chairman of the National Nursing Planning Committee of the National Nursing Council for War Service. She takes the place held for a year by Marion W. Sheahan, R.N., Director of the Division of Public Health Nursing, New York State Department of Health, and President of the National Organization for Public Health Nursing, who resigned in May because of the pressure of other duties. Miss Sheahan remains a member of the executive committee.

The Planning Committee, according to the announcement, is making progress in rounding out its composite program for nation-wide study and action aimed at providing "nursing service at a high level of competence for all the people." Work in those areas demanding immediate action is not to be delayed until the entire program is agreed upon. The program will, indeed, more or less continually be in process of evolution, as initial studies and fact-finding activities point to adjustments.

Members of the executive committee, besides Miss McIver and Miss Sheahan, include Agnes Gelinas, R.N., Director of the Skidmore College School of Nursing; Alma C. Haupt, R.N., Director, Nursing Bureau of the Metropolitan Life Insurance Company; Lucile Petry, R.N., Director, Division of Nurse Education, U. S. Public Health Service; Ruth Sleeper, R.N.,

Assistant Principal of the School of Nursing, Massachusetts General Hospital; and Ruth G. Taylor, R.N., Director, Nursing Unit, Children's Bureau of the U. S. Department of Labor. The Executive Secretary since September, 1944, has been Marjorie B. Davis, R.N., formerly chairman of the Massachusetts Nursing Council for War Service. The Director of Research is Margaret L. Plumley, R.N.

#### PROGRAM ON HEALTH EDUCATION IN PHILADELPHIA

On May 2, the Philadelphia Department of Public Health launched a concentrated year round educational campaign to improve the health of the citizens of Philadelphia. Attention is to be focused on pertinent facts concerning those diseases which constitute the greatest menace, and the medical schools, local professional groups and allied agencies are coöperating. A steering committee has been set up and the Department of Health will provide speakers and educational material, including sound motion picture films. The first program is devoted to tuberculosis and a slogan chosen to be used throughout the campaign is "Is There Tuberculosis in Your Home? Find Out!". Similar programs will be carried out for rheumatic heart disease, nutrition, child health, diabetes, cancer, venereal disease, labor, industry and industrial medicine, respiratory diseases, clubs, personal hygiene and mental hygiene.

#### REPORT OF INTERNATIONAL HEALTH DIVISION OF THE ROCKEFELLER FOUNDATION

Chief activities of the Health Commission of the International Health Division of the Rockefeller Foundation in 1944 were louse control studies in Mexico, typhus and malarial control in Italy, malarial work in Egypt, the study of infective jaundice and other infectious diseases, nutrition studies in

England and the manufacture and distribution of yellow fever vaccine. These projects were financed by \$1,000,000 earmarked for this emergency work out of the total budget of \$3,200,000 for the entire Division. In 1944 attention was concentrated on twelve specific diseases, the most important of which were yellow fever, malaria, typhus, and the deficiencies related to nutrition. Perhaps the most significant contribution of the International Health Division to public health has been in the field of public health education. In 1944 fairly substantial sums were appropriated for fellowships and travel grants and for the support of schools of hygiene and public health nursing and to support nursing schools in Canada, Colombia, Brazil, Ecuador, Argentina, Venezuela, and Portugal. According to the annual report, the Division carried on operations in 23 different countries. In its research program, the report of the Division indicates significance in the discovery of active virus of yellow fever in a sick monkey, a marmoset. The animal was seriously ill and soon died after it had been trapped in June, 1944, by the laboratory at Ilhéus, Brazil. Exhaustive laboratory tests showed conclusively that it had died of yellow fever. The episode is historically interesting, the report points out, because it is the first time in any country that a wild animal has been picked up in its natural habitat suffering from yellow fever and holds support to the thesis that yellow fever is primarily a disease of jungle animals transmitted by "jungle mosquitoes."

#### INDUSTRIAL HEALTH ENGINEERING IN THE TENNESSEE VALLEY AUTHORITY

The paper "Industrial Health Engineering in the Tunneling Operations of the Tennessee Valley Authority" presented by Frank N. Chirico, P. A. Engr., (R.), U.S.P.H.S., at the joint

session of the Engineering and Industrial Hygiene Sections of the American Public Health Association at the 73rd annual meeting in New York on October 4, 1944, is being printed in bulletin form by the Authority and will be released about June 30. The bulletin, complete with photographs and engineering drawings, deals with the control of toxic dusts and gases and exposures to excessive temperature and humidity encountered in the tunneling operations at Ocoee, Apalachia, Fontana, South Holston, and Watauga Dam Construction Projects, located in Tennessee and North Carolina. Engineering methods of control employed, the degree of control achieved, and ventilation rates necessary for eliminating various tunnel hazards, are discussed and presented in the report.

The bulletin is the first of a number of preliminary reports to be issued by the Authority concerning industrial health engineering practices in the construction of dams and tunnels. Inquiries concerning the report should be addressed to the Health and Safety Department, Tennessee Valley Authority, Chattanooga, Tenn.

**Correction:** On page 667 of the June, 1945, JOURNAL, Gilbert Cottam, M.D., State Superintendent of Health, Pierre, was incorrectly named as State Health Officer of South Carolina. It should have read South Dakota.

#### PERSONALS

##### Central States

WILLIAM EDWARD BLAIR, M.D., of Lebanon, Ohio, who has completed 25 years as Health Commissioner of Warren County, has been reappointed for an additional two year term.

DANIEL S. BAUGHMAN, M.D.,† of Madison, S. D., has been appointed

\* Fellow A.P.H.A.

† Member A.P.H.A.

Superintendent of the Lake County Board of Health in South Dakota, succeeding CLARENCE E. SHERWOOD, M.D.,† Madison, City Health Officer and member of the State Board of Health.

JOHN R. MCGIBONY, M.D.,† of Chicago, Director of Health, U. S. Office of Indian Affairs, was transferred on April 15 to the Hospital Facilities Section of the U. S. Public Health Service, Washington, D. C., of which DR. VANE M. HOGE is Director. He will be succeeded by DR. RALPH B. SNAVELY,† U. S. Public Health Service, whose recent assignment was District Medical Director of the Indian Service in San Francisco and Albuquerque, N. M.

EDWARD B. MILLER, M.D., has been appointed Health Officer for District Number 2 in Illinois including the Counties of Boone, Lake, and McHenry, with headquarters in Woodstock. Dr. Miller, who was recently in the Medical Corps of the Army of the United States, succeeds DR. FRED O. TONNEY.†

#### Eastern States

MARY BEARD, R.N., was awarded the honorary degree of Doctor of Laws by Smith College, at the Commencement in May. Miss Beard was recently Director of the Nursing Service of the American Red Cross and formerly Director of Public Health Nursing, International Health Division, Rockefeller Foundation.

BAILEY B. BURRITT,† of New York, N. Y., Executive Secretary of the Health Maintenance Committee of the Community Service Society of New York was recently awarded the Doctor of Laws degree by the University of Rochester, in Rochester, N. Y.

WILLIAM L. HUGHES, PH.D.,\* President of the American Association for Health, Physical Education and

Recreation, has been named to direct the Physical and Health Education Department of Temple University, Philadelphia, Pa., it was announced by DR. ROBERT L. JOHNSON, President. Dr. Hughes, now a member of the faculty of Columbia University, will begin his new duties September 1. FREDERICK PROSCH, present Temple director, will remain as a full professor at the request of Dr. Hughes.

STANLEY H. OSBORN, M.D.,\* of Hartford, Conn., State Health Officer, was recently awarded the honorary degree of Doctor of Public Health by Trinity College in Hartford.

#### Southern States

JOHN D. BIGGER, M.D., of Swannanoa, N. C., formerly a missionary to Korea, has been appointed Director of Medical Work in the Philippines for all interdenominational agencies, according to the *Asheville Citizen-Times*, March 25, which reported also that the appointment was made by the Committee for Relief in Asia of the Federal Council of the Churches of Christ in America. It was stated that Dr. Bigger's task is to reestablish medical missions in several of the Philippine Islands as rapidly as possible.

L. E. BURNEY, M.D., New Orleans, La., Medical Director, U. S. Public Health Service, was recently appointed State Health Commissioner in Indiana with headquarters in Indianapolis. Dr. Burney, who is on leave from the Public Health Service, will succeed THURMAN B. RICE, M.D., who has been Acting State Health Commissioner since DR. JOHN W. FERREE was given leave to enter the U. S. Navy.

FRANKLIN L. GEIGER, M.D.,† of Columbia, S. C., Assistant Director of Rural Sanitation, State Board of Health, has been appointed Medical

Director of a tuberculosis survey which is being carried on in South Carolina.

J. M. GOODEN, formerly State School Supervisor, has been chosen State Coördinator of Health Education to inaugurate a program to coördinate and utilize all available services of the state which can contribute to the promotion of better health among Georgians. Mr. Gooden was chosen by a joint committee from the Georgia Department of Public Health, the State Department of Education, and the University System of Georgia. The program will be confined principally in the beginning to a few selected counties where an intensive health program will be developed in the schools and communities, according to *Georgia's Health*. A grant from the W. K. Kellogg Foundation, Battle Creek, Mich., is financing the project. Mr. Gooden's headquarters are with the Georgia Department of Public Health, Atlanta 3.

DON M. GRISWOLD, M.D.,\* of Albany, N. Y., Consulting Epidemiologist, New York State Department of Health, is substituting for DR. HUGH R. LEAVELL,\* Professor of Public Health and Bacteriology at the University of Louisville School of Medicine, in Kentucky, and is on leave of absence by courtesy of DR. EDWARD S. GODFREY, JR.,\* the New York State Commissioner of Public Health. Dr. Leavell is now in the regional headquarters of the UNRRA in London.

FRANK P. HUNTER, M.D., of Warren, N. C., has been chosen Health Officer of Warren County.

ROYAL W. WILLIAMS, M.D.,† of Orange-City-County Health Unit, Orange, Tex., has become Acting Director of the County.

#### CHANGES IN HEALTH OFFICERS IN FLORIDA

FRANK V. CHAPPELL, M.D., Tampa, has been appointed Director of the Hillsborough County Health Department, succeeding CHARLES W. PEASE, M.D., also of Tampa, who was named Epidemiologist of the Department.

KOLBEIN L. K. WAERING, M.D., Jacksonville, Director of the Duval County Department of Health, has resigned.

JOSEPH A. MARKLEY, M.D.,† U.S.P. H.S., has been appointed Health Officer of Duval County, succeeding Dr. Waering.

#### CHANGES IN HEALTH PERSONNEL IN TEXAS

FREDERICK R. LUMMIS, M.D., Houston, was recently named Chairman of the Houston Board of Health, succeeding EVERETT L. GOAR, M.D., who resigned to devote more time to his activities as Professor of Ophthalmology at the Baylor University College of Medicine, Houston. The following have recently been placed in charge of the health units designated:

DR. WYLY H. HARRIS, Raymondville, of Willacy County.

DR. GUS N. LANCASTER, Granbury, of Hood County.

DR. BYRON L. JORDON, Daisetta, reappointed, of Liberty County.

DR. CLIFFORD G. SWIFT, Cameron, of Milam County.

DR. SAM J. R. ARONSON, Amarillo, of Potter County.

#### Western States

MILLARD F. SCHAFER, M.D.,† Director of the City-County Health Unit at Colorado Springs, Colo., has been elected President of the Colorado Public Health Association for the ensuing year.

### Foreign

**JAMES W. BASS, M.D.,\*** former Director of Public Health of Dallas, Tex., has been promoted to the rank of Colonel in the U. S. Army Medical Corps. He has been responsible for preventive medicine measures in the Southwest Pacific war for more than three years. He was one of the officers who received chief credit for reducing the incidence of malaria in New Guinea by 95 per cent within a few months.

**COL. SOHAN L. BHATIA,** Deputy Director General of the Indian Medical Service and Dean of the Medical School of the University of Bombay, was a recent visitor to the A.P.H.A. office. Colonel Bhatia was sent by the Indian Government to study methods of administration and organization in various medical schools in the United States. He will aid in the initiation of a public health program in India and will help to found a number of medical schools throughout the country.

**DR. RENE SAND** of Brussels, Belgium, formerly Minister of Health of Belgium and Belgium's representative to the Health Section of the League of Nations, is now reported to be safe and well after captivity by the Germans. He has returned to Brussels, according to word from the Belgian Embassy in Washington.

### Deaths

**DANIEL WARREN POOR, M.D.,** of Narrowsburg, N. Y., died March 29, aged 75. He was associated with the Department of Health of New York City for more than 25 years, retiring in 1929 as Assistant Director of the Bureau of Laboratories.

**PAUL AUGUST TESCHNER, M.D.,** died at his home in Elmhurst, Ill., on May 25, aged 48. He was Assistant Director of the Bureau of Health and Public Instruction of the American

Medical Association since 1935 and in this capacity, he lectured before various groups throughout the country and was well known to lay agencies interested in health activities.

**JAMES THOMAS WAYSON, M.D.,** of Honolulu, Hawaii, died January 11, aged 74. He served as Assistant Administrator and Member of the Board of Health of Hawaii and was City and County Physician of Honolulu from 1911 to 1918 and General Health Officer of Hawaii from 1918 to 1931. In 1932, he was instrumental in setting up a separate board of hospitals and settlement to administer the leprosy phase of public health and held the position of Board Physician from the time of its inception until his retirement in 1943.

\* Fellow A.P.H.A.

† Member A.P.H.A.

## Bactericides are different

FREE  
BULLETIN  
GIVES  
PROOF



Free bulletin shows why Diversol . . . with its 10 "action features" . . . is different from ordinary bactericides. A quick-acting, crystal sodium hypochlorite, Diversol helps control bacteria, mold, and yeast. The Diversey Corporation, 53 W. Jackson Blvd., Chicago 4, Ill.

# American Journal of Public Health and THE NATION'S HEALTH

---

Volume 35

August, 1945

Number 8

## Tuberculosis Mortality in England and Certain Other Countries During the Present War\*

JAMES A. DOULL, M.D., F.A.P.H.A.

*Professor of Hygiene and Public Health, Western Reserve University,  
Cleveland, Ohio*

BOMBS and shells have brought injury or death to untold thousands of civilians in enemy occupied Europe. The tragedy of this situation has obscured less immediate but not less destructive effects of the war on the lives of these unfortunate people. Over many decades, and to varying degrees, they had built up their defenses against infectious diseases. They had shelter, food, hospitals, medical and health services. For many, these defenses were completely removed. They were forcibly removed from their homes, herded into ghettos or concentration camps, starved or beaten to death. For others, technically described as "displaced persons," and estimated to number twenty to thirty millions, the extent of deprivation has varied, but, in general, it has resulted in overcrowding, dietary deficiencies, and long hours of

labor. For those permitted to remain in their homes, there has been great variation in extent of privation but there has been a quite general shortage of essential foods, especially oils and fats. Malnutrition is widespread in Poland and Greece, and is undoubtedly very prevalent in all large cities of enemy occupied countries.

The effect of such an intensification of deleterious influences upon morbidity and mortality from tuberculosis will never be told to the satisfaction of the vital statistician. Dislocations of populations have been too great. Little credence, moreover, can be given to statistics released by the Nazis. The following extracts<sup>1</sup> from reports given at the Royal Society of Medicine in London in December, 1943, need no comment except to state that whether or not they are overdrawn, they give no satisfaction to the statistician.

---

\* Presented at a Joint Session of the Health Officers, Vital Statistics, and Epidemiology Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

the daily ration in France yielded only 1,084 calories and was deficient in fat, protein, and sugar. Tuberculosis was increasing alarmingly and the Germans were enforcing silence about it. They had returned to France many tuberculous prisoners, most of them urgently needing treatment."

"Dr. H. P. Cawadias described famine conditions in Greece. Well-to-do people in Athens had one ounce of bread on alternate days, camomile tea, and gruel, with oil, carrots, and chicory coffee. Sausages of dog, rat, and cat were sold at outrageous prices. The mortality was terrible; they had ceased to bother about tuberculosis."

"Professor J. Young quoted a paper by Professor Heymans of Ghent, who had been punished severely by the Nazis for publishing it. The daily basic ration was only 1,230 calories. Certain classes were allowed supplementary rations but, although rations were adequate for the younger children, they were worse as age advanced. Tuberculosis was rife and was increasing."

#### GREAT BRITAIN

For reliable statistics we must turn to Great Britain. Mortality figures are available for England and Wales, and for Scotland, for each of the war years to the end of 1943. The Committee on Tuberculosis in Wartime<sup>2</sup> has published tabulations for respiratory and other forms of tuberculosis, by sex and certain age groups, to the end of 1941. For provisional data for 1943, and for a special tabulation of the deaths from tuberculosis of the central nervous system in England and Wales by age groups, for the years 1938-1943, inclusive, the writer is indebted to Dr. Norman F. Smith and to Dr. Melville MacKenzie, both of the Ministry of Health of Great Britain.

According to pre-war figures, in England and Wales, 98 to 99 per cent of all cases of pulmonary tuberculosis and about 70 per cent of all non-pulmonary tuberculosis were due to the human type of bacillus. In Scotland the proportion of bovine infections was higher and it is stated that about 5 per cent of cases of pulmonary tuberculosis were caused by the bovine type.<sup>2</sup>

Tuberculosis is still widespread among cattle in Great Britain,<sup>2</sup> the infection rate before the war being about 40 per cent. About 6 per cent of all farms were sending out milk containing tubercle bacilli and it was inferred that practically all bulked milk containing the mixed milk from twenty or more herds must contain the bacilli. In 1939, only about 3 per cent of the dairy farmers had had their herds tested. In London, 93 per cent of the milk is pasteurized; in the small towns only a small proportion, and in rural districts, practically none. One unavoidable result of the wartime evacuation policy was that it transferred large numbers of children from London and other large towns, where a considerable amount of the milk is pasteurized, to districts where practically all milk is supplied raw.

In the decade preceding the outbreak of war, mortality from all forms of tuberculosis in England and Wales had fallen by about one-third, from 91 per 100,000 in 1928, to 60 per 100,000 in 1938. In Scotland also, tuberculosis mortality had displayed a similar downward trend. Not only was the outbreak of war followed by arrest of these favorable trends but there occurred in England and Wales, and in Scotland, a definite increase in the number of deaths from tuberculosis. This is all the more significant because, as pointed out by Heaf and Rusby,<sup>3</sup> there was no increase in the death rate from all causes.

The ratio of the deaths in subsequent years to those in 1938 is shown for males and for females of each area in Table 1. In England and Wales a rise in the number of deaths occurred in both respiratory and non-respiratory tuberculosis, the latter increasing somewhat more than the pulmonary form. The increase in pulmonary tuberculosis affected males (12 per cent) slightly more than females (10 per

TABLE 1

*Deaths from Tuberculosis in England and Wales, and Scotland, by Sex and Form Actual Deaths for 1938, and Ratio (Per cent) of Deaths in Each Subsequent Year to Those in 1938\* .*

Year	Respiratory				Other Forms			
	Males		Females		Males		Females	
	E. & W.	Scot.	E. & W.	Scot.	E. & W.	Scot.	E. & W.	Scot.
1938	12,445	1,396	8,837	1,185	2,261	435	1,996	416
1939	102	108	100	102	99	94	93	96
1940	112	120	110	115	105	112	105	115
1941	112	118	109	124	117	119	119	130
1942	101	112	96	125	107	109	107	116
1943	105	113	94	118	98	109	105	123

\* Figures for 1943 are provisional. Deaths among non-civilians are included.

cent); while the increase in other forms of the disease affected females (19 per cent) somewhat more than males (17 per cent). Reaching a peak in 1940 or 1941, the number of deaths reached approximately the 1938 level in 1943. Female mortality from pulmonary tuberculosis was, under the circumstances, very favorable in 1943, being more than 6 per cent below that for 1938, while for other forms of tuberculosis female mortality in 1943 was still 5 per cent above the 1938 level. Male mortality, on the other hand, showed just the reverse picture; for the pulmonary form it was 5 per cent higher in 1943 than in 1938, and for the non-pulmonary forms, 6 per cent lower.

In Scotland, the increases were relatively greater than in England and Wales for both respiratory and non-respiratory forms. Females were affected substantially more than males. Furthermore, the decline in Scotland since the peak year has been unsatisfactory. The number of deaths from all forms of tuberculosis was 15 per cent higher in 1943 than in 1938.

*Age incidence*—In England and Wales, the increase in deaths from pulmonary tuberculosis in 1940 and 1941 affected mainly children, younger women, and older men. For other forms of tuberculosis, the percentage increase was greatest in children,

adolescents, and young adults of both sexes. In Scotland, much the same age groups were affected by the increases but they were proportionately greater than in England and Wales, particularly in young adults (15–24 years).

*Tuberculosis meningitis*—The chief feature of non-respiratory tuberculosis during the present war has been the increased frequency of tuberculous meningitis. For England and Wales, the number of deaths from tuberculous meningitis in 1941 exceeded the average for the years 1938 and 1939 by 34 per cent in males, and by 38 per cent in females. For Scotland the comparable increases were 37 per cent in males, and 60 per cent in females.

In Table 2, the average numbers of deaths from tuberculosis of the central nervous system in England and Wales for 1938 and 1939 are shown by age groups, with the percentage increases or decreases in subsequent years. All age groups were adversely affected, but especially persons under 35 years of age. In the younger ages, improvement occurred after 1941, but this is not evident among those over 15 years of age.

No studies on the type of tubercle bacillus present in these cases have come to the writer's attention and it is improbable that extensive investigations have been made. Probably the bovine bacillus has played a larger rôle than



TABLE 2

*Deaths from Tuberculosis of the Central Nervous System in England and Wales, by Age Groups  
Average Number of Deaths in 1938 and 1939,\* with Ratio (Per cent) of Deaths  
in Each Subsequent Year to this Average*

Year	Age Groups in Years			
	0-4	5-14	15-34	35 and Over
Average 1938-39	794	435	380	105
1940	105	105	124	119
1941	138	137	140	120
1942	110	112	136	114
1943	104	109	137	125

\* Deaths of non-civilians are included.

before the war, but it is noted in the Report of the Committee,<sup>2</sup> from which much of this material is taken, that there was a considerable increase in respiratory tuberculosis among children, caused chiefly by the human type and that there was a considerable increase in tuberculous meningitis among children in London where the bulk of the milk is pasteurized.

The years 1940 to 1943 were marked also by large increases in meningococcal meningitis. It seems improbable, however, that error in diagnosis could have played any substantial part in the recorded increases in deaths from tuberculosis of the central nervous system.

In an interesting study of tuberculosis in the war years in Glasgow, Laidlaw and MacFarlane<sup>4</sup> reported, in 1941, the results of their investigations of the occupations of persons suffering from tuberculosis. The figures show little increase among commercial and professional classes whose hours of work had not been greatly increased, and that the heavy incidence fell upon the workers in heavy industries, and to a less extent on workers in medium heavy industries. The standard of overtime accepted by the authors is that the weekly hours of labor should not exceed 60 hours for men and 55 hours for women. For the commercial class it is stated that only 20 per cent were working in excess of the standard, as compared with 67 per cent in heavy

industries and over 40 per cent in the medium heavy industries.

The Committee<sup>2</sup> has also compared the environmental changes of the First World war with those of the present war:

"The chief environmental changes that are peculiar to this war are: (1) the evacuation of many tuberculosis hospitals and sanatoria in September, 1939, to make room for expected air raid casualties, with the consequent return to their homes of numerous patients in an infective state; (2) the institution of blackout conditions, which, by diminishing ventilation, increase cross-infection and possibly lower general resistance; (3) overcrowding in the homes, due to destruction of residential property by enemy action and the added effect of billeting; (4) evacuation of the population, which may have led to billeting in homes containing infective tuberculous persons, and, conversely, to the introduction of tuberculous persons into healthy homes; (5) evacuation of town populations to the country, with the result that many children previously supplied with pasteurized milk have had to change over to a raw milk supply. The first four factors would favour pulmonary infection with the human type; the fifth, non-pulmonary infection with the bovine type."

Certain environmental changes are common to both wars: Chief among these is the great increase in industrialization. Owing to the demand for labor, persons suffering from active tuberculosis have been employed with resultant exposure of fellow-workers. Large numbers of persons who had lived a relatively isolated existence have entered factories for the first time. The general resistance of laborers may have

been lowered by long hours of labor, fatigue being increased by duty as home guards, fire-watchers, or other civil defense occupations.

Comparison is made also in the report<sup>2</sup> of the course of mortality in England and Wales in the First and Second World Wars. The increase in tuberculosis deaths from 1914 to 1916 was 5 per cent for males and 7 per cent for females, as compared to 11 per cent for males and 13 per cent for females from 1939 to 1941. In the First World War the increase was largely in middle childhood and early adult life; in the present war it has extended into early childhood and later adult life. There is a striking contrast between the large increase in deaths in children under 5 years of age in the present war and the slight decline in tuberculosis deaths in this age group between 1914 and 1916.

Reports from Germany indicate that mortality from tuberculosis increased following the outbreak of war. In the Berlin area, a rise in the number of deaths from acute forms has been reported, especially in the age group 30-35 years. The writer has not found any reports from Italy. If the experience of the last war is repeated, tuberculosis will be more serious in enemy countries after collapse than during the war.

The data which have been available to the writer concerning Spain, Switzerland, and Sweden have been too limited to justify discussion.

#### DISCUSSION

As a consequence of the war, there has occurred in Great Britain not only an arrest of the downward trend of tuberculosis but a considerable increase over pre-war levels in mortality from the disease. There have probably been far greater increases in certain enemy occupied countries.

The experience of Great Britain indicates that increased exposure to infec-

tion has been a major factor. In support of this view the rise in tuberculous meningitis is especially significant. The London experience suggests that the human type of tubercle bacillus has been chiefly responsible, although probably the bovine type has played a rôle considerably more important than in pre-war days.

Greater exposure would account also for some of the increase in mortality from pulmonary tuberculosis. Massive dosage in children may result in an acute and fatal primary pulmonary process; and, in older persons who have recovered from a childhood infection, acute pulmonary tuberculosis of the reinfection type may be a sequel to such dosage.

A simpler explanation of much of the increase in adults is that it may have been the result of an acceleration of mortality rather than of a real increase in morbidity. Many patients returned to their homes from sanatoria and some of these, as well as others with active disease, desiring to aid the prosecution of the war, concealed their illness and entered industry.

Any discussion of possible lowering of resistance can be little more than speculative. If it be granted that dormant or healed tuberculosis can be stirred into activity by fatigue, then this factor should have serious consideration. Rather superficial observation leads the writer to the conclusion that malnutrition has probably not been a major factor. Very great attention has been paid to the dietary in Great Britain and especially to the importance of protective foods.

#### REFERENCES

1. Foreign letters. Nutrition in Enemy Occupied Europe. *J.A.M.A.*, 124:251 (Jan. 22), 1944.
2. Report of the Committee on Tuberculosis in Wartime. Medical Research Council Great Britain. London: His Majesty's Stationery Office, 1942.
3. Heaf, F., and Rusby, L. A Further Review of Tuberculosis in Wartime. *Tubercle*, 23:107 (May), 1942.
4. Laidlaw, S., and MacFarlane, D. Factors Influencing the Increased Incidence of Pulmonary Tuberculosis in Glasgow. *Brit. M. J.*, 2:63 (July 18), 1942.

# Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization\*

EDWARD BIGG, M.D., B. H. JENNINGS, M.E., AND  
F. C. W. OLSON †

*Associate in Medicine, Northwestern University Medical School; Professor and Chairman, Department of Mechanical Engineering, Northwestern Technological Institute; and Research Associate, Northwestern Technological Institute, Evanston, Ill.*

THE clearly established bactericidal and viricidal effect of glycol vapors on air-suspended microorganisms has presented a new means for attack on the problem of control of air-borne infection. Following intensive laboratory studies on the fundamental aspects of this problem, which have been well summarized in a recent publication,<sup>1</sup> certain practical studies were necessary before full scale clinical application could be attempted. These included investigation of possible fire hazards in the use of these compounds,<sup>2</sup> observations on the properties of glycol vapors in large spaces, and the development of apparatus for generation and distribution of the vapor.<sup>3, 4, 5</sup>

The encouraging outcome of these studies led to a large scale field trial to determine if the incidence of air-borne infections can be reduced by treating

living quarters with triethylene glycol (TEG) vapor in effective concentrations.‡ Triethylene glycol was used in this study since it is effective in much lower concentrations than propylene glycol and has been shown to be similarly non-toxic in the recommended concentrations.

## MATERIALS

*Location of Study*—Two two-story barracks, each consisting of two wings, were selected for study. These buildings were divided into eight dormitories, each 120 x 30 x 9 ft; each dormitory housed approximately 80 men in 40 double bunks about 1½ ft. apart. It was decided to use four of the dormitories for test, and four for control purposes. The east wing of one building and the west wing of the other (four dormitories) were used as tests; the remaining four dormitories served as controls. We started with 320 test individuals and 320 controls, which were replaced by a new group of men at 6 week intervals. We were able to observe three such groups, or a total of 1,000 men in the test group and 1,000 in the controls. This number is approximate since some men were transferred and exchanged during our ob-

\* Presented at a Joint Session of the Epidemiology, Health Officers, Laboratory, and School Health Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944. The work described in this paper was done under contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Northwestern University.

† With the technical assistance of Margaret Melody and Silva Trautman.

‡ The engineering aspects of this test have been described in detail elsewhere.<sup>6</sup>

servation periods. An intermingling of personnel occurred during the day in mess halls, classrooms, drill halls, recreation halls, etc., but since we believed that the grèatest incidence of cross-infections and the grèatest degree of air contamination occurs in sleeping quarters, it was felt that significant results could be obtained by treating only those quarters.

The problem of maintaining comfortable room temperature was difficult. A single outside thermostat controlled the heat input of each building (two test and two control dormitories) with no available means for the closure of individual steam radiators. Thus, with closed windows and doors in test dormitories, it was necessary to bring in large quantities of fresh cold outside air through the duct system described below, to keep the test room temperatures within comfortable limits. Despite this measure there were occasional uncomfortable rises in temperature, necessitating the opening of windows, with a resultant lowering of glycol concentrations. Temperature adjustment of the control dormitories was left to the discretion of the occupants.

Since it has been shown that dust is of importance in air contamination, and since sleeping quarters are notoriously high in dust content due to bed-clothes, etc., it was decided to effect a simple dust control measure by treating the floors in both test and control dormitories with a light floor oil.

*Triethylene Glycol (TEG)*—The chemical, physical, and pharmacological properties of triethylene glycol have previously been described.<sup>1</sup> In brief, it can be stated that the vapor is effective in low concentrations, it is non-toxic and non-inflammable in these concentrations, the cost is nominal, and no odor is perceptible. A relative humidity of 25 to 60 per cent is desirable for optimum bactericidal action, but killing of air-suspended microörganisms occurs

in a humidity range of 20 to 80 per cent. A special "air sterilization grade" of triethylene glycol was supplied by the Carbide and Carbon Chemicals Corporation. This material is highly refined and free from the impurities commonly present in the glycol purchased on the open market.

*Vaporizer*—A great deal of effort and time was expended in the development of a method of glycol generation which would introduce glycol-vapor at a predetermined controllable rate.

Glycol-vapor was generated by vaporization from an aqueous glycol solution. Since this is a miscible binary mixture, the temperature at which boiling takes place varies with the concentration of the particular mixture. When a glycol-water solution is heated, water, being the more volatile component, vaporizes more readily; however, both water and glycol vapors are delivered from the boiling mixture. The more rapid loss of water results in a solution richer in glycol and raises the boiling point of the mixture. It can be seen that if the relative proportions of the boiling glycol and water are kept constant, the respective proportion of glycol- and water-vapor emitted from the vaporizer will remain constant and the total output of vapor will depend on the heat input or rate of boiling.

This vaporizer aids in maintaining desired humidities as well as obtaining effective glycol concentrations, and is described in detail in a previous publication.<sup>4</sup>

*Duct and Fan System*—The size and shape of the dormitories, and a double row of lockers extending the length of the room necessitated the construction of a duct system to distribute glycol and water-vapor uniformly throughout the space.

Figure 1 shows the general arrangement of the equipment. For clarity the lockers and two nearby bunks are not shown. At the far left is the fresh air

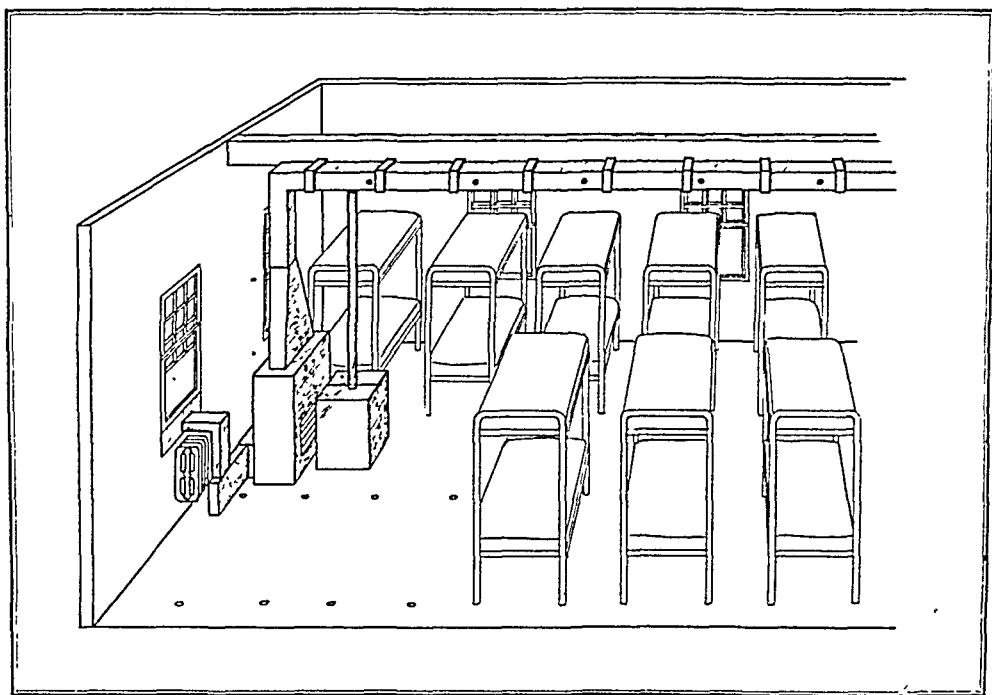


FIGURE 1—Diagrammatic representation of duct, fan unit, and vaporizer as installed in dormitory

intake coming from a special fitting in the window. The fresh air enters the back of the blower fan unit through a set of dampers. Recirculated room air enters the front of the fan unit through the louvres (visible in the drawing) and another set of dampers. Both sets of dampers may be controlled by a lever mounted on the top of the fan cabinet. Thus the air output can be varied uniformly from 100 per cent fresh air to 100 per cent recirculated air. The fan output may be varied in six steps to produce from 750 to 1,700 cu. ft. per minute at free delivery of the fan. The air is blown from the fan into the pyramid shaped adapter piece, and then enters the duct through a right-angled elbow provided with turning vanes. The duct is of laminated asbestos construction, specially treated to resist the absorption of glycol.\* The air leaves

the duct through circular openings  $2\frac{3}{32}$  in. in diameter, spaced 5 ft. apart, on each side of the duct. The vaporizer is mounted on the floor in front of the fan unit and delivers the glycol-water vapor through a well insulated  $1\frac{1}{4}$  in. pipe to the distributing duct.

*Sampling Tables*—To facilitate the taking of glycol and bacterial samples in the crowded dormitories, special sampling tables were built (Figure 2). These were sturdily constructed of  $\frac{3}{4}$  in. pipe and pipe fittings. Rubber-tired wheels are fitted to the front legs and pipe caps to the rear legs. A motor vacuum pump unit provided with an extension cord is mounted on the horizontal braces by pipe straps forming, in effect, a vibration-free, three-point suspension. On the front end of the table top is fastened a rack for holding test tubes for glycol samples and "Moulton air samplers" for bacterial samples. The rack proved not

\* This material was supplied by the Philip Carey Mfg. Co., Lockland, Ohio.

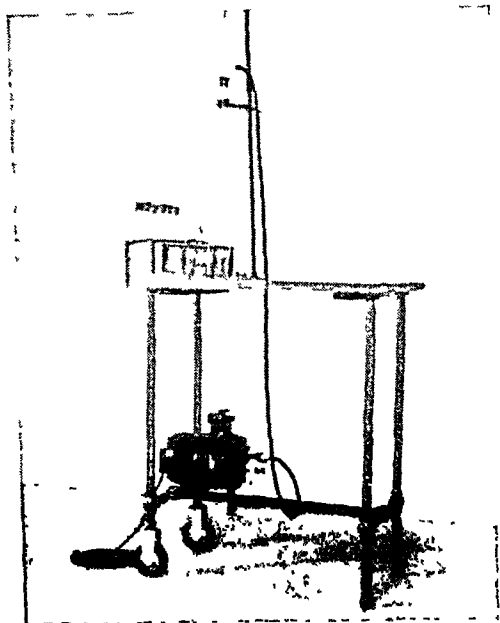


FIGURE 2—Table used for obtaining glycol and bacterial samples

only convenient but it also reduced breakage. A  $\frac{3}{4}$  in. pipe in a floor flange bolted to the table top serves as a ring-stand for holding test tubes and air samplers while samples are being taken. There is ample space on the table for writing purposes. These tables made it possible to take air samples in all parts of the dormitories and at any desired height.

*Operation of Equipment*—Following the installation described above measurements were made to obtain the relative air velocities through the various outlets of the duct, and air samples were also taken at the openings for glycol determinations. The results showed remarkably uniform distribution of air and glycol, and demonstrated that complete mixture of glycol and air had occurred before the first opening was reached, and that there was no perceptible loss of glycol as the air flowed through the duct.

For adequate ventilation it was decided to allow not less than 25 cu. ft. per minute of outside air per individual. Since it was estimated that the uncon-

trolled normal infiltration of air was equivalent to two air changes per hour, the fan speed was set to deliver from 1,000 to 1,200 cu. ft. per minute of outside air. Even in well constructed buildings there is a considerable amount of infiltration and exfiltration which cannot be determined accurately; it depends not only on the general tightness of construction, particularly around windows and doors, but also on wind velocity and direction. To reduce this inaccuracy to a minimum it is essential to keep all doors and windows closed and to depend on bringing in fresh air by means of the fan alone. Therefore, every effort was made to keep the doors and windows of the treated rooms closed. All air entering the duct was "glycolized." Ventilation in the control room was at the discretion of the occupants; it is believed that the number of air exchanges was greater than in the test quarters. Since the volume of the room was 33,000 cu. ft., with the equivalent of four air changes per hour, it was calculated that a glycol delivery of 0.04 lb. per hour would be needed to maintain a concentration of approximately 0.004 mg. TEG per liter of air. To obtain this output the operating vaporizer temperature was set at 280° F., using a 1,000 watt heater. This setting gave a concomitant water delivery of 2.5 lb. per hour.

#### METHODS

*Glycol Determinations*—Since preliminary observations showed uniform distribution of glycol throughout the treated space it was decided to take all air samples for glycol analysis at one fixed location in each test room. Air samples were taken at 2:00 A.M., 5:00 A.M., and 8:00 A.M. daily. These hours were chosen to coincide with the times at which air samples for determination of bacterial content were taken. Four cu. ft. of air were collected and analyzed for glycol content by a modification of

the technique described by Wise, *et al.*<sup>7</sup> The results were recorded as mg. TEG per liter of air.

*Bacterial Determinations*—Samples were taken in all the dormitories at the hours noted above. Since it is well known that movement of individuals within a space produces a sharp rise in the number of air-borne bacteria, we attempted to determine the air contamination at the highest and lowest point of room activity. At 2:00 A.M. the men were asleep, at 5:00 A.M. (Reveille) activity was greatest, and 8:00 A.M. the men had left their quarters.

Using a Moulton bacterial sampler, 10 cu. ft. of air were collected at the same position as used for glycol samples. Pour plates were made with 1 ml. of the sample, using blood agar media, and colony counts were recorded as colonies per cu. ft. of air, noting the number of colonies of hemolytic streptococci. Aliquots were also plated in media to which gentian violet (1-500,000) had been added.<sup>8</sup> The latter procedure was used to enable us to determine the presence of hemolytic streptococci more readily, but was not entirely satisfactory and was discontinued.

*Temperature and Humidity*—These observations were also made at 2:00 A.M., 5:00 A.M., and 8:00 A.M. Individual records were kept for each dormitory, including both test and controls. A sling psychrometer was used and wet and dry bulb readings were recorded. Records on outside weather conditions were also kept.

*Throat Cultures*—At the beginning of each observation period throat cultures were taken of each individual, both in the test and control groups. Swabs of the throat were placed in tubes containing 1 ml. of tryptose-phosphate broth (for convenience in carrying) and subsequently plated on blood agar. At the end of the 6 week

period this procedure was repeated. Careful individual records were kept.

*Diseases Studied*—The following diseases were considered to be air-borne and were used in the compilation of our statistics: catarrhal fever, common cold, measles, German measles, mumps, scarlet fever, rheumatic fever, acute tonsillitis, otitis media, chicken pox, acute sinusitis, and pneumonia. Our data were obtained from outpatient diagnoses preliminary to hospitalization, and the diagnosis used was that of these records.

The record of each individual under observation in this study thus consisted of (1) throat culture at beginning and end of test period; (2) hospitalization with diagnosis, (3) outpatient visits with diagnosis; and (4) dormitory and bunk location.

#### DATA

*Glycol Concentrations*—Although it has been shown that for immediate killing of air-suspended organisms a concentration of 0.005 mg. TEG per liter of air is desirable, it was our belief that sufficient bactericidal and viricidal effect would be produced by the use of a somewhat lower concentration. We further realized the difficulties inherent in the enforcement of the rule for closed windows and doors at all times. Thus fluctuations in concentration may have occurred at times other than those at which analyses were taken.

The results of our analyses were quite constant. Although we occasionally obtained values as high as 0.010 and as low as 0.001 mg. TEG per liter, for the most part the concentration was between 0.0025 and 0.003. At no time was there any fog formation. It is interesting to note that we obtained a small but significant correlation between wind velocity and glycol concentration.

Frequent interrogation of the men concerning possible effects of the vapor elicited no evidence of irritation of the respiratory tract.

*Temperature and Humidity*—The room temperatures both in test and control dormitories were higher than desirable, averaging 72° F. in the control spaces and 75° F. in the test. The relative humidities recorded in the test and control dormitories showed an average approximately 5 per cent higher in the former. We were able to maintain the relative humidity within the optimum range for bactericidal glycol activity.

*Bacterial Counts*—Many workers have noted the extreme fluctuations of air bacterial content occurring in occupied spaces. We also observed this phenomenon. The most important factor influencing the variation in number of air-suspended organisms is the amount of movement in the room. We found that in the samples taken at 2:00 A.M. bacterial counts were relatively low as compared with the number of recoverable bacteria at the time of Reveille.

The overall reduction due to the action of glycol is shown in Figure 3. Each point of the curves represents a logarithmic average of the twelve readings obtained from four dormitories at three different times during the day. Large fluctuations have been reduced by 3-point moving averages.<sup>9</sup>

The occurrence of hemolytic streptococci in the controls was extremely sporadic. Many days often passed without their appearance, but isolated samples frequently contained hundreds of colonies. A great reduction of hemolytic streptococci in the test spaces was observed.

*Incidence of Infection*—For approximately the first half of each observation period, there was little difference in hospital admission rate between control and test. Following this inconclusive phase, however, a definite effect was noted. For the first entire 6 week period there were 63 admissions from the control group and 56 from the test,

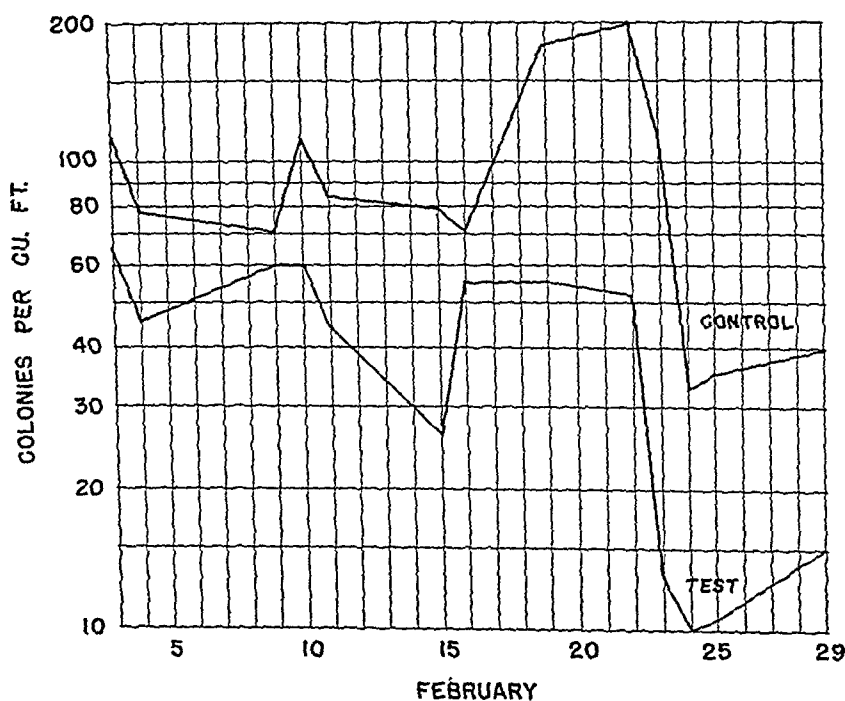


FIGURE 3—Daily bacterial counts in test and control dormitories, showing reduction obtained in glycol-treated spaces



representing a reduction of 11 per cent. During the last 17 days, there were 19 admissions from the control and 7 from the test, or a reduction of 63 per cent.

Data from the second 6 week observation period showed comparable values, i.e., 63 from the control and 55 from the test (13 per cent reduction). The last 17 days showed 34 cases as compared with 12 (65 per cent reduction).

The third observation period produced inconclusive data. This was due to the fact that conditions produced by high outside temperatures and unsatisfactory overheating of the sleeping quarters during the last 3 weeks of the test resulted in opening of windows, effecting a lowering of the glycol concentration. Combining the first two periods, we find a total of 126 hospital admissions from the control dormitories and 111 from the test quarters, or a reduction of 12 per cent. For the final 17 days of both periods, there are 53 from the control as compared to 19 from the test, representing a reduction of 64 per cent.

Table 1 records our experience in a study of a small epidemic of mumps. For the first 3 weeks (the recognized incubation period of this disease) there was a fairly comparable rate of admissions from both the test and controls. Thereafter there were only 4 additional cases from the test barracks while 14 cases occurred in the control dormitories.

TABLE 1  
*Record of Hospitalizations for Mumps, Showing Effect of Glycol Following Mumps Incubation Period*

	Test	Control
Total Number of Hospitalizations in 24 day period	9	9
Total Number of Hospitalizations for succeeding 17 days	4	14

There was no apparent correlation between total incidence of infection and outside weather conditions.

*Throat Cultures*—The results of these observations were most striking. A surprising number of individuals were found to harbor hemolytic streptococci in their throats. The average incidence in incoming men was 24 per cent. This figure represents the average percentage found in a total of approximately 2,000 men (three test periods).

A sharp reduction occurred in individuals exposed to the action of glycol vapors in their sleeping quarters. This is shown in Table 2 which represents

TABLE 2  
*Incidence of Positive Throat Cultures (hemolytic streptococci) in Test and Control Dormitories Before and After 6 Week Observation Period*

	First Period		Second Period	
	Test	Control	Test	Control
Average incidence in incoming men, per cent	24	22	34	27
Average incidence in outgoing men, per cent	11	25	8	24

the percentage of positive throat cultures in test and control men. The original incidence of 34.2 per cent in this test group fell to 8 per cent at the end of the 6 week period. This may be compared to the reduction from 27.3 per cent to 24.1 per cent in the controls. A similar effect was produced in the first 6 week period during which the incidence of positive findings in the test fell from 24 to 14 per cent, while in the control there was a rise from 22 to 25 per cent. In the third period little significant change was noted. These data are reported on a percentage basis rather than in numbers of individuals, since a transfer of men occurred during the observation period and there were some individuals from whom we could not obtain cultures at both the beginning and end of the test period. We cannot state at what time during the test period the change noted above occurred since only two cultures were

taken from each individual. It would be of interest to have more frequent cultures taken.

An attempt was made to analyze further the above data. This was done in the manner illustrated in Table 3 which represents the 6 week period from January 29 to March 10. Records were kept to show losers (positive initial throat culture, negative final throat culture); gainers (negative initial throat culture, positive final throat culture); and keepers (positive initial throat culture, positive final throat culture). Statistics on the first period were similar to those shown in the table, while little effect occurred in the third period.

The most significant finding was the greater number of losers, and the

TABLE 3

*Per cent Loser, Gainer, and Keeper in Individual Dormitories and Average Total Test and Control*

<i>Test</i>	<i>Per cent Loser</i>	<i>Per cent Gainer</i>	<i>Per cent Keeper</i>
Dormitory 1	32	0	4
Dormitory 2	29	6	6
Dormitory 3	28	6	3
Dormitory 4	30	3	3
<i>Control</i>			
Dormitory 1	26	12	0
Dormitory 2	26	13	14
Dormitory 3	12	33	7
Dormitory 4	11	9	11
Average Test	30	4	5
Average Control	19	16	8

smaller number of gainers and keepers in the test as compared to the controls.

A similar system of recording losers, gainers, and keepers was used for the separate dormitories studying their oc-

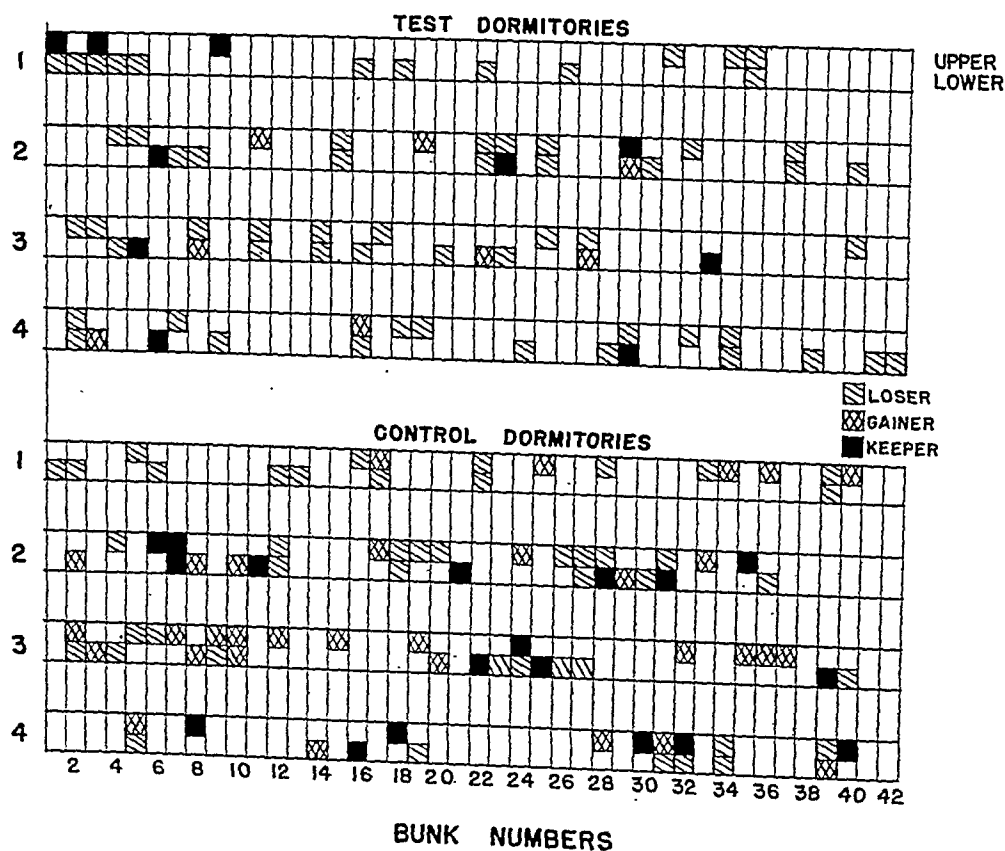


FIGURE 4—Record of individuals according to bunk location, showing losers, gainers and keepers

currence in relation to location of bunks. This is diagrammatically represented in Figure 4.

#### DISCUSSION

*Incidence of Diseases*—As stated above, we realized at the outset of our studies that certain limitations as to the conclusiveness of our observations were unavoidable. It is obvious that sources of cross-infections other than sleeping quarters would occur. We were unable to control the men during periods of classroom instruction, drill, eating, and leave. However, we felt that since the greatest reservoir of infection was present in the dormitories (other workers<sup>10, 11</sup> have presented evidence to substantiate this hypothesis), a demonstration of a statistically significant reduction in air-borne disease would be possible.

It was particularly unfortunate that an observation period longer than 6 weeks was not feasible since we appeared to be getting a most encouraging effect after an initial 3 week period of time had elapsed. The interpretation of this observation is not entirely clear but reasonable explanations may be presented.

From a study of Table 1, one can state that the men hospitalized for mumps during the first three weeks received their infection previous to their coming under our observation. This resulted in the fairly equal distribution in cases between test and control groups. It may further be seen that spread of the infection was reduced in the group sleeping in glycol-treated atmosphere. Considering the shorter incubation period of the more acute respiratory diseases, it does not seem possible to explain all our findings on this basis. However, it does suggest that under conditions of crowding and the bringing together of individuals from various walks of life and localities, the incubation period of these infections may be altered.

Another explanation may be considered. During the first few weeks when a number of individuals are placed in close contact, those most susceptible contract disease, and those less susceptible escape. During the entire 6 week period one can postulate the progressive building up of air and bed-clothing contamination in the dormitory. The use of glycol vapors prevents the contamination from reaching the concentration necessary to affect those individuals of lesser susceptibility, while in the control dormitories such action does not occur.

In this regard we wish to point out that the data on recovery of air-borne bacteria (Figure 3) does not give a true representation of the air bacterial population at all times. The counts include many non-pathogens and, of course, give no index of air contamination by viruses. The most significant observations gathered from the air sampling are the overall reduction in colony count and the practical abolition of hemolytic streptococci in the test dormitories.

The data recorded on the basis of observations in individual dormitories showed a consistency in the number of hospitalizations and infections from each. A study of infections according to the location of bunks in the dormitories suggested a greater degree of isolated cases in the test quarters, as compared to the controls where there were numerous clusters of infections. This was particularly well shown in the study of mumps. Another interesting observation in regard to the mumps epidemic was that in one control dormitory housing a group of men coming from a different station from those in the other seven dormitories, not a single case of mumps occurred. This lends further strength to the belief that most cross-infections occur in sleeping quarters, since there was complete intermingling of men during their work day.

An attempt to evaluate the influence of triethylene glycol vapors on outpatient visits was inconclusive. There were many difficulties encountered, such as incorrect diagnosis, multiple visits by single individuals, frequent visits by men who had no demonstrable infections, etc.

*Throat Cultures*—It is shown that in groups living in atmospheres containing bactericidal concentrations of triethylene glycol, the incidence of hemolytic streptococci found in the throat is reduced. This is demonstrated clearly in the first two periods where approximately 650 test and 650 control individuals were observed. A breakdown of the data suggests that this reduction is not due to the direct action of the glycol in the respiratory tract but is produced by its effect on the air-borne bacteria. It has been shown that in the test dormitories the difference between the initial and final cultures was caused by a greatly increased number of men developing negative throat cultures with only a small percentage developing positive cultures during the exposure period (Table 3). It would appear that in the test spaces, death of hemolytic streptococci occurs promptly when they are introduced into the air either by expression of the organisms directly from the respiratory tract, or secondarily introduced from bed-clothing, etc. This action prevents the dissemination of organisms to the throats of susceptibles. The increased number of "gainers" (Table 3) in the control dormitories further substantiates this hypothesis.

From a study of the data shown in Figure 4 it would appear that the presence of glycol in the test dormitories prevented the spread of hemolytic streptococci between adjacent bunks. There were very few gainers as compared to the control dormitories where new individuals developed positive throat cultures appearing in

clusters radiating from previously demonstrated carriers. Control of the high local bacterial concentration about a carrier's bed produced by direct expression from the respiratory tract and secondary introduction from the bed-clothing is probably effected by glycol vapor.

It is significant to point out the observation made in the third period studied. This group of men served as an interesting control on the first two periods. With an inadequate glycol concentration there was no effect on either the incidence of infections or throat cultures. It would appear, therefore, that in large groups there is some correlation between frequency of occurrence of hemolytic streptococci in the throats of individuals under observation and incidence of respiratory disease in the group as a whole; and that an index of glycol efficiency may be determined by this effect. Although there was no apparent relationship between the incidence of hemolytic streptococci and infection in individuals, our data suggests that if glycolized air prevents the spread of hemolytic streptococci from one person to another, it also prevents the spread of other air-borne microorganisms including viruses.

#### CONCLUSIONS

1. Bactericidal concentrations of triethylene glycol and optimum humidity conditions were maintained in large living quarters.
2. A reduction in total bacterial air contamination was produced.
3. Hemolytic streptococci were practically eliminated from the air of glycol-treated dormitories.
4. A definite reduction in air-borne infections was effected.
5. Control of a small epidemic of mumps was attained.
6. Prevention of spread of hemolytic streptococci from the throat of one individual to another was demonstrated.

#### SUMMARY

A practical installation for triethylene glycol generation and distribution

was made in a military camp. Glycol concentrations of 0.0025 to 0.004 mg. per liter of air and optimum relative humidities were maintained. Studies were made on three groups of 640 men, observed for 6 week intervals and equally divided into test and controls; the former sleeping in glycol-treated quarters, the latter in untreated dormitories. An overall reduction in air-borne disease of 12 per cent was produced for the entire period, but the statistics on the final 17 days showed a reduction of 64 per cent. Explanations for this phenomenon are presented. The incidence of hemolytic streptococci recovered from throat cultures of men exposed to the effect of the glycol vapors fell dramatically in contrast to the control individuals. There was a definite prevention of spread of these organisms in the dormitories.

## REFERENCES

1. Robertson, O. H. *The Harvey Lecture Series*, XXXVIII:227, 1942-43.
2. Bigg, E., Jennings, B. H., and Fried, S. Inflammability Characteristics of Propylene Glycol and Triethylene Glycol in Liquid and Vapor Form. *Am. J. M. Sc.*, 207:370-74 (Mar.), 1944.
3. Bigg, E., Jennings, B. H., and Fried, S. The Use of Glycol Vapors for Bacterial Control in Large Spaces. *Am. J. M. Sc.*, 207:361-69 (Mar.), 1944.
4. Bigg, E., and Jennings, B. H. The Introduction of Glycol Vapors for Air Sterilization by a New Vaporization Method. *J. Indust. Hyg. & Toxicol.*, 26:307 (Nov.), 1944.
5. Jennings, B. H., and Bigg, E. Engineering Problems in the Use of Glycol Vapors for Air Sterilization. *A.J.P.H.*, 34:477 (June), 1944.
6. Jennings, B. H., Bigg, E., and Olson, F. C. W. The Use of Glycol Vapors for Air Sterilization and the Control of Air-borne Infections. *Heat., Pip. & Air Cond.*, 16:538 (Sept.), 1944.
7. Wise, H., Puck, T. T., and Stral, H. M. A Rapid Colorimetric Method for the Determination of Glycol in Air. *J. Biol. Chem.*, 150:61, 1943.
8. Garrad, L. P. Selective Bacteriostatic Action of Gentian Violet. *Brit. M. J.*, 1:290-291, 1942.
9. Croxton, F. E., and Cowden, D. J. *Applied General Statistics*, 1942, p. 386.
10. Dudley, S. F. The Schick Test, Diphtheria and Scarlet Fever. Medical Research Council. *Spec. Rep. Series*, No. 75, 1923.
11. Dudley, S. F. The Spread of Droplet Infection in Semi-Isolated Communities. Medical Research Council, *Spec. Rep. Series*, No. 111, 1926.

## Best Sellers in the Book Service for July

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945.....	\$1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945 . . . . .	.35
Global Epidemiology. James S. Simmons, M.D., Tom F. Shayne, M.D., G. W. Anderson, M.D., and H. M. Horack, M.D., 1944.....	7.00
Borderlands of Psychiatry. Stanley Cobb. 1944.....	2.50
Municipal and Rural Sanitation. V. M. Ehlers and Ernest W. Steel. 3rd ed., 1943.....	4.00
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed., 1945 . . . . .	4.00
Vital Statistics Directory. American Public Health Association. 3rd ed., 1945.....	.75
Nursing in Prevention and Control of Tuberculosis. H. W. Hetherington, M.D., and Fannie Eshleman, R.N. Rev. ed., 1945.....	3.00
Health Instruction Yearbook, 1944. Oliver E. Bird, Editor. 1944.....	3.00

Order from the Book Service

# Does Health Education Prevent Venereal Disease?\*

The Army's Experience With 8,000,000 Men

CAPTAIN GRANVILLE W. LARIMORE AND  
LIEUTENANT COLONEL THOMAS H. STERNBERG

*Medical Corps, Army of the United States, Washington, D. C.*

WITHIN the past three years the Army has had an unprecedented opportunity to study at first hand the results of the mass use of compulsory health education directed at a single group of infections, the venereal diseases. We have been able to apply intensively virtually all of the accepted techniques of health education, and it is our intent in this paper to describe the methods used and to delineate our experiences and results.

## AN OUTLINE OF THE ARMY PROGRAM

The venereal disease education of the soldier is a continuing process which begins at the time of his induction and continues until his discharge. This educational process is inaugurated at the induction station with the distribution of a brief pamphlet. At the reception center, the next step in his military career, he is given talks on sex hygiene and venereal disease by a medical officer, a line officer, and a chaplain. In addition, he is shown a film on the subject and given another pamphlet. At the replacement training center

where the soldier's basic military training is completed, two hours are devoted to venereal disease education, employing film strips, supplemented by talks by officers. After the soldier has completed his basic training and is assigned to a unit, his education in venereal disease is pursued by means of further talks at regular intervals, and by the use of additional films, pamphlets, posters, and other health educational media.

Since the first of January, 1944, when it became apparent that the trend of venereal disease incidence in the Army was upward, there has been an intensification of all of our control measures, particularly venereal disease education.

This intensification translated into the production of material has brought about a program for 1944 which calls for the production of two new films on venereal disease, a new film strip, two pamphlets for general distribution to troops in this country, and a schedule of one new venereal disease poster each month. In addition, utilization is being made on a local level of lectures, bulletins, charts, prophylaxis station lists, match-book folders, and other forms of reminders. Besides our venereal disease education program in this country we have distributed in overseas theaters, forty posters, several pamphlets,

---

\* From the Venereal Disease Control Division, Preventive Medicine Service, Office of The Surgeon General.

Presented before the Southern Branch American Public Health Association at its Annual Meeting in St. Louis, Mo, November 14, 1944.

and other materials particularly aimed at the specific problems of the different theaters. In all, it is expected that the total amount of graphic educational material distributed this year will approach 15,000,000 pieces and that our film audiences will be in the neighborhood of 10,000,000.

Thus, to our knowledge, the Army venereal disease educational program far exceeds any civilian experience for a comparable period. In fact, it is believed that the Army program represents, in extent and scope, one of the largest health education projects ever attempted in the field of preventive medicine.

#### AIMS OF ARMY VENEREAL DISEASE EDUCATION PROGRAM

The aims of the program have been to prevent venereal disease among troops through utilization of educational procedures as an adjunct to an overall control program, and to study and evaluate various types of educational materials and methods of approach. It became evident early that there are two distinct and separate phases of venereal disease education, and that failure to recognize these separate aspects in the use of education as a venereal disease control measure results in loss of effectiveness. These phases are:

1. The imparting to the individual of adequate technical knowledge about the venereal diseases, how they are spread, and how they may be prevented.

2. The motivation within the individual of the will to avoid either illicit sexual intercourse or unprotected sexual exposure.

*Imparting technical knowledge*—The imparting of technical knowledge to the soldier is essentially a function of the medical officer, utilizing the formal lecture and various training aids.

*Motivation to avoid venereal disease*—The mere possession of technical knowledge in itself is not sufficient to prevent venereal disease. It is neces-

sary that the individual be motivated to use such knowledge when it is needed. In the Army, this motivation involves complex, and in many instances intangible factors, which are related to such diverse conditions as the religious and educational background of the soldier, the influence of the home and community, the attitude of his commanding officer, the esprit de corps of his unit, fear of the diseases or their treatment, fear of shame or ridicule, and many others, over most of which the Army has little direct control.

#### METHODS OF APPROACH

*Fundamentals*—In converting these aims of the program into practical educational procedures we have learned that certain principles are essential for the successful use of education as a tool of venereal disease control. Chief among these are:

1. Each educational procedure regardless of type must be prepared or delivered with a particular purpose in mind. In short, hit or miss education is wasteful and relatively non-effective. The program must be planned so that each procedure fits into an overall coordinated whole, each part of which is interrelated to the other.

2. Health educational materials must be of the highest possible quality. In an effort to achieve this the Medical Department has sought and received the advice of experts in the field of motion pictures and the graphic arts. We have attempted to provide material that is attractive and readable, with the liberal use of art work and color. While such material may entail a greater cost of production, it is to be pointed out that in the final analysis the most wasteful and expensive health educational materials are those which are so drab or uninviting that they are not read at all but are rather promptly discarded by the recipient.

3. In all of our educational materials we have endeavored to abandon completely the pedagogical concept of health education and have striven for a new approach of what might be termed "health advertising." Our posters, pamphlets, and other materials do not talk down to the soldier; neither do they preach to him. Instead they are slanted in so far as possible in the language and atti-

tude of the "GI." We have tried to stay away from the textbook type of approach and instead have tried to emulate the techniques of the brochures and copy that have made American advertising the standard for the whole world.

4. We have also attempted to avoid over-emphasis on the subject from the standpoint of sex and further have sought in the preparation of our materials not only to refrain from giving offense, but also to avoid that which is distasteful either esthetically or intellectually. We have also tried to make the educational approach such that it avoids any psychological impact that might be productive of future phobias about the venereal diseases or sex, for while we do want to instill a healthy respect for the venereal diseases and their consequences, we do not want to develop a group of venereal disease or sex neuroses.

5. Accuracy and technical correctness are principles which should be regarded as inviolable. This is particularly true at the present time when improved methods of treatment tend to minimize the potential physical damage of the venereal diseases. Loose statements of the bogeyman type will tend to discredit the entire program in the minds of those whom we wish to influence.

6. Continence is stressed as the only certain way of avoiding venereal disease and every effort is made to see that our material in no way presents the subject so that the individual who was continent when he came into the Army is influenced to change his sex habits to those of promiscuity.

#### MOTIVATION

As has been stated above, the basic aims of our venereal disease educational program are to impart technical knowledge and then to motivate the individual to use that knowledge at the time it is needed. The imparting of technical knowledge has been found to be a relatively simple, straightforward procedure, but that of motivation has been much more difficult of accomplishment. In fact we are frank to admit that we know of no single universally effective appeal to induce the soldier either to avoid exposure or to take prophylaxis. Further, the multitude of factors influencing human behavior dictate the necessity for a variety of approaches to this problem. In the Army,

the most effective have been as follows:

1. *Fear* is the dominant theme of many of the appeals that have been successfully used. We realize that much of pedagogical and medical opinion will differ with us on the value of fear as a motivation; yet we have found that it operates in the minds of the soldiers as one of the most potent reasons for the avoidance of venereal disease. Fear is being used in this sense not only simply as a fear of the diseases themselves and the pain associated with them, but also as a fear of the effect on future health and home life; fear of the effect on sex capacity or the individual's ability to become a father; fear of punitive measures; and fear of the disease as representing positive proof of the violation of religious and moral codes. In our experience fear operates less as a deterrent to promiscuous sex exposure than it does as a motive for inducing the individual to take prophylaxis. There is one important aspect of the use of fear as a motivation that needs particular emphasis at this time, namely, that fear of the venereal diseases themselves will be decreasingly effective from now on, as improved techniques of therapy render them less and less serious, and perhaps eventually relegate them to comparatively minor infections.

2. *Intelligence*—Appeal to reason for the avoidance of the venereal diseases on logical grounds is of value with the more intelligent portion of our group. When this appeal is augmented with the theme that smart men don't get venereal disease, and that acquiring venereal disease is evidence of a degree of stupidity on the part of the individual, it becomes even more potent.

3. *Pride*—Pride has been found to be an effective appeal, not only reflected in the individual's pride in himself which makes him want to avoid venereal disease, but also pride in his unit, his race, and in the Army itself.



4. *Patriotism*—Into this category can be grouped all of the motivations related to the war itself, such as those that have their basis in appeals to stay on the job to "keep 'em rolling" or "keep 'em flying" and for each man to shoulder his fair share of the burden and not absent himself because of venereal disease. Another aspect that has been effectively used is based on the fact that a man who acquires a preventable infection such as venereal disease is indirectly giving aid or comfort to the enemy by taking up bed space and the time of medical personnel better devoted to caring for the wounded.

5. *Moral approach*—In our experience appeals to avoid venereal disease strictly on moral lines, through the avoidance of illicit sexual intercourse, have been of limited value. It is well to recall that venereal disease education as we use the term is not evangelism, it cannot substitute for the home, the church, or the school as a builder of character, nor can it provide a moral background for proper standards of personal conduct. Surveys of troop samples indicate that in a high percentage of instances the initial sex experience occurs prior to induction into the Army, and there is little to indicate that we have been at all successful in converting to continence those individuals who were promiscuous before their entry into the service.

*Factors influencing motivation to avoid venereal disease*—In analyzing the reasons for our failures to influence all of our soldiers to avoid venereal disease we have found that the following factors are among the most important:

1. The very nature of the sex urge itself which tends to cancel out much of the effects of our educational efforts.

2. Counter-propaganda against the practice of continence that we have termed "education for venereal disease." This is comprised by the

sexually stimulating motion picture, the sexy comic strips, the pin-up girls, and the mass use of sex as a selling agent in certain advertising. All of these tend to glamorize and romanticize sex and its ever-present by-product, promiscuous sexual intercourse. Unfortunately this propaganda for sex exerts the greatest influence on the younger, more easily impressed age groups.

3. The effect of what is loosely termed "war psychology." It is the same mass reaction that has brought about an increase in juvenile delinquency and a flood of the so-called "Victory Girls." Basically, of course, this prevalent trend is to a great extent a current variant of the old "eat, drink, and be merry" proverb of long standing, accentuated through a wartime release of inhibitions. Translated into terms of our problem, we observe men throwing aside what they have been taught in a burst of so-called last fling activity, or giving vent to a flood of pent-up emotions upon returning from months of arduous and often dangerous duties.

4. The displacement of normal associations with family and friends, with a resultant disruption of customary relationships, which has operated as an effect of the war.

5. The newer methods of treatment which have already begun to lessen the concern of troops over the venereal diseases and their seriousness.

6. Alcohol, with its minimizing effect on inhibitions, has been a considerable factor in dulling the value of venereal disease education, particularly at the time the individual needs most to apply what he has learned.

7. Morale or esprit de corps of the man's unit is a prominent factor influencing the incidence of venereal disease. A man, dissatisfied at the moment with conditions in his Army service, is very prone to disregard what he has been taught about venereal disease, and it is believed by many that

the venereal disease rate represents a fair indication of the state of morale and discipline of a unit.

#### MEASUREMENT OF RESULTS

How then in the midst of these conflicting factors can we measure the results of our venereal disease educational program? Not entirely by examining our rates of venereal disease incidence; for while our rates for the nearly three years of this war are not only far less than those of any past war, but are also as low as those of any previous three years of the Army's history in peace or war, there are many other venereal disease control procedures in part responsible for them. Such rates represent the bookkeeping result of so many complex factors that it is difficult to abstract the rôle that venereal disease education alone plays.

*Technical knowledge*—Nor, as has already been pointed out, can we measure the effectiveness of our results in the terms of the amount of technical knowledge about the venereal diseases possessed by our soldiers. Surveys of random samples of troops indicate that we have succeeded very well on the whole in imparting adequate knowledge about the venereal diseases. In fact we found that there was often no significant difference between the knowledge about venereal disease possessed by groups who have acquired venereal disease and those free of infection, provided of course that the groups being compared were similar from the standpoint of age, length of service in the Army, and educational background prior to Army service.

On the other hand, it is believed that the best single criterion for determining the immediate value of education in preventing venereal disease in the Army is the extent to which prophylaxis facilities and materials are used. It is considered that this is a legitimate yardstick with which to measure the

effectiveness of our educational program, since most soldiers were unfamiliar with at least chemical prophylaxis before entering the service. In determining the extent of the use of prophylaxis in the Army, consideration must be given not only to official station prophylaxis, which has been difficult to popularize because of factors such as inaccessability and lack of privacy, but also to the use of individual prophylaxis, both mechanical and chemical. The importance of the rôle which prophylaxis plays is indicated by the current Army requirements of more than fifty million individual prophylactic items monthly. Surely the utilization of this enormous number of prophylactics must prevent a vast amount of venereal disease, and is the result to a large extent of adequate venereal disease education.

#### SUMMARY AND CONCLUSIONS

1. The Army has had an unprecedented opportunity to study at first hand the results of the mass use of compulsory health education directed at a single group of infections, the venereal diseases.
2. The Army VD educational program has applied virtually all of the accepted techniques of health education, and its extent is such that during 1944 the amount of graphic educational material distributed will approach 15,000,000 pieces, and film audiences will total 10,000,000.
3. The aims of the program are (a) to impart technical knowledge about the venereal diseases, and (b) to motivate the individual to utilize this information at the time it is needed for the avoidance of venereal disease.
4. Certain principles have been found to be essential for the successful use of education as a tool of venereal disease control. Chief among these are (a) an integrated program, (b) highest possible quality and attractiveness of all educational materials, (c) abandonment of the pedagogical concept of health education and substitution of a new approach of "health advertising," (d) avoidance of over-emphasis on sex, (e) technical accuracy of all materials.
5. In motivating the individual to utilize the knowledge he has been given, the following factors have been found to be effective as

appeals: (a) fear, (b) intelligence, (c) pride, (d) patriotism.

6. Among the reasons for failure of motivation are (a) the nature of sex urge itself, (b) "education for VD" afforded by sexy motion pictures, comic-strips, pin-up girls, and the use of sex in certain advertising, (c) "war psychology," (d) displacement of normal family and social relationships, (e) newer methods of treatment, (f) alcohol,

(g) state of morale. The strictly moral approach to the problem of avoiding venereal disease has been relatively ineffective in the Army.

7. In measuring the results of the program, the best single criterion is believed to be the extent of utilization of prophylaxis in the Army, which at the present time is at the rate of more than fifty million individual prophylactic items per month.

---

## Health Education Specialists on Local Health Department Staffs

The Association's Subcommittee on Local Health Units in its report published during the summer, recommends about 500 specialists in health education to serve the more populous of the 1,200 units of local health jurisdiction through which it believes local health service in Continental United States may be served with economy and efficiency. The committee report frequently points out that the most effective health education is done by the public health nurse in her family visiting and community contacts, by the medical and dental clinician in his hygiene instructions and his interpretation of medical findings, and by the public health engineer in his interpretation of environmental factors in personal and community hygiene.

In the more than 900 suggested units with populations of less than 100,000, the committee believes that, with only minimum resources, the health education work of doctors, public health nurses, and engineers must for economy be supplemented by the health education service of the state departments of health.

For 261, about one-fifth of the 1,200 units, the committee recommends 543 health educators. These would serve

nearly 60 per cent of the population of the United States, in the ratio of approximately one per 130,000 population. In contrast, the committee found only 44 health educators employed by all local health departments in 1942. These were confined to 12 states.

The qualifications for health educators prepared by the Association's Committee on Professional Education in 1943,\* estimated that at that time there were between 400 and 500 employed in both official and voluntary agencies in the United States (exclusive of teachers in public schools and colleges). It is unlikely that the pool of trained personnel in this field has been increased to more than 600 during the war period. There is an immediate need, therefore, for the training of approximately 500 specialists in health education to meet minimum local health needs. If the desirable goal expressed by many state health officers for a health educator in each unit regardless of population is to be met, more than 1,000 persons will need to be trained as health educators in the immediate or near future.

---

\* Educational Qualifications of Health Educators. An Official Report of the American Public Health Association. *A.J.P.H.*, 33:8 (Aug.), 1943. Reprints available.

# Amebiasis in a Hospital for the Insane

WILLIAM B. BIRNKRANT, M.D., MORRIS GREENBERG, M.D.,  
AND CAPT. HARRY MOST, MC, AUS \*

*Bureau of Preventable Diseases, and the Bureau of Laboratories, Department of Health, New York, N. Y.*

SURVEYS made in various parts of the western hemisphere have disclosed the existence of amebiasis in an appreciable portion of the population from Central West Canada (52° 30' N. latitude) to the Strait of Magellan (52° S. latitude).<sup>1</sup> The presence of endemic foci has been disclosed wherever surveys have been made. The percentage of carriers reported varies markedly, depending on climate, economic and social status, crowding, environmental hygiene, laboratory techniques, and the experience of the technician. Thus, in Northern New Mexico and Arizona, Spector and Hardy<sup>2</sup> reported 25.5 per cent of a group of 2,725 Indians and non-Indians positive for cysts of *Entamoeba histolytica*, although the actual incidence of clinical dysentery was very low. Headlee,<sup>3</sup> on the other hand, found only 0.8 per cent of carriers of *Entamoeba histolytica* in a survey of intestinal parasitism in patients of the Indiana University Medical Center Hospital. Beltoan and Lorenas<sup>4</sup> reported an infection rate for *Entamoeba histolytica* of 47 per cent in a group of 410 pupils in a public boarding school in Mexico City.

From December, 1942, to August, 1943, an investigation of amebiasis was made by the New York City Department of Health in a hospital for the

insane. An opportunity thus presented itself for making a survey of the institution. From May to December, 1942, 14 cases of amebic dysentery had been reported. An additional 81 cases and 124 carriers were found during the investigation, making a total of 95 cases and 124 carriers found between May, 1942, and August, 1943. These are the subject of this report.

## CLINICAL DESCRIPTION

The cases were divided clinically into mild and severe cases. Mild cases had diarrhea as the chief, and often the only, symptom, without any blood in the stool. Fever was absent. The duration of the diarrhea was several days.

In severe cases diarrhea was marked and the stools were frequent. In almost all cases there was blood in the stools. Abdominal cramps were experienced by many. Fever occurred in all.

## INVESTIGATION

The investigation was carried on by the New York City Department of Health with the coöperation and help of the New York State Department of Health during the latter part. Until February 15, 1943, all laboratory examinations were made by the pathologist of the hospital. Beginning on this date and until April 30, 1943, the parasitologist of the City Department of Health was placed in charge of the

\* On leave of absence. This work was completed prior to co-author's entrance into military service.

laboratory survey, and the actual work of stool examinations was performed at the hospital by two experienced technicians of the department, aided by two more technicians loaned by the New York State Department of Health.\*

There were examined 5,882 stool specimens from 1,249 inmates and 688 employees. The zinc flotation method of Faust was used to examine all specimens. In addition, saline and iodine smears of fresh, warm specimens were examined from every individual with symptoms of diarrhea, and from a number of symptomless carriers. An average of 8 specimens per case and 3 specimens per person in the survey was examined (Table 7).

#### THE HOSPITAL

The institution is composed of a group of 45 buildings. Eight large buildings are used for housing inmates. At the time of the investigation there were 4,767 inmates and 808 employees. There had been 1,165 admissions and 1,130 discharges and deaths during the year. This represented an approximately average annual turnover.

There are 3 large and 2 small kitchens supplying food for inmates and employees. Kitchen 1 supplied 1,519 inmates and employees. In kitchen 2, food was prepared and served to about 2,364 inmates and employees. In kitchen 3, food was prepared for a total of 1,320 inmates and employees. Kitchen E supplied the doctors' dining room where 123 doctors and staff members ate. On an 80 acre farm, fruits and vegetables are grown and chicken houses are maintained for egg production. A small kitchen is maintained for the 16 farm workers.

Nine employees did not eat in the institution.

#### SANITARY SURVEY

A complete sanitary survey was made of the hospital.\* It included the water and milk supplies, the sewage disposal, and the methods of storing, handling, cooking and distributing food for employees and inmates. Although this institution, like others of its kind, suffered during this period from a shortage of competent help, and although a number of inmates were used as food handlers in the kitchen, the general level of sanitation was fair.

#### WATER SUPPLY

The water supply comes from four wells 600 to 800' deep. The effluent of all four wells is run through a bed of marble chips and then to a treatment house where hydrated lime is fed from a proportioner into the water for the purpose of raising the pH. The water is run into a 1,000,000 gal. capacity reservoir, covered with concrete. From the reservoir, the water is pumped into a 368,000 gal. steel stand pipe 100' high. Water for general purposes, including fire, comes from the standpipe and is fed through a single system of distribution mains.

#### SEWAGE DISPOSAL

The sewage disposal is part of the general sewage disposal system of New York City.

#### PLUMBING

A number of plumbing hazards were found. These included cross-connections of several bubble drinking fountains to waste pipes, submerged inlets and obstructed and overflowing water closets. Two aspirators in the laboratory and one in the autopsy room were connected to the cold water supply without intermediate vacuum breakers or check valves. The aspirators in the laboratory were used to clean pipettes; the one in the autopsy room was used to evacuate fluids from cadavers.

Water pressures taken at various fixtures in the cellars and top floors ranged from 44 to 80 lb. Uranium tests for back siphonage

\* The technicians from the City Department of Health were Mrs. Mary V. F. LaRiviere and Mrs. Margaret Modin. They were assisted at different times by Albrecht Weber, Anne Orzel and Mrs. Helen Horton of the State Health Department.

\* We are indebted to Messrs. C. G. Wigley, A. Abrahamson, and J. Schiffner of this department for their assistance.

were applied to the obstructed water closets and the aspirators. The results were negative. Tests were made on a cross-connected drinking fountain by plugging the trap and allowing the water to run into the basin until it had risen about an inch above the strainer on the outlet. The fountain was then turned on and a sample of water taken for bacteriological examination. The sample revealed no bacteria and no *B. coli*. Methylene blue was then added to the water in the basin. The water of the fountain was then turned on and 50 ml. samples were drawn into bacteriological sample bottles. In one of the fountains a blue color appeared in the fifth bottle. In the other, the water remained clear in the twentieth bottle.

Thirty-three samples of water were obtained from different parts of the buildings for bacteriological analysis, and one for chemical analysis. None contained *B. coli*. Two one-liter samples were obtained from the bubble drinking fountains, and delivered to the Parasitology Clinic. Settling was allowed for three days, after which the upper 900 ml. were siphoned off. The remaining 100 ml. were treated by the zinc sulfate flotation method. No amebae were found.

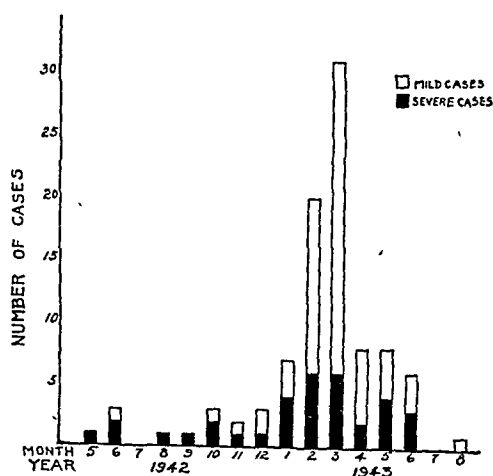
#### MILK

Pasteurized milk was used throughout the hospital, except for a small supply served to the resident physicians and other staff members and their families. This supply came from a small dairy composed of two heifers and three milking cows which produced 40 quarts of milk daily. The milk was used raw and was produced under insanitary conditions, and without sterilization of equipment. Closure of the dairy was recommended. In spite of the unsatisfactory conditions in this dairy, it apparently played no part in the spread of the outbreak, since the incidence of amebiasis was unusually low in the group served by it. Among all the people who used this milk regularly, only two physicians developed amebiasis, and they had sufficient opportunity to get the infection in other ways.

#### CASE INCIDENCE

From May through December, 1942, 14 cases were reported. Thereafter, cases increased rapidly; their recognition was probably a result of the intensive investigation. There were 7 in January, 20 in February, and 31 in March, 8 in April, 8 in May, 6 in June, and 1 in August, a total of 95 (Chart 1).

CHART I  
AMEBIASIS IN A STATE INSTITUTION  
CASE INCIDENCE



Of the total number, 65 occurred in inmates and 30 in employees. When classified according to severity, there were, among the inmates, 28 severe and 37 mild cases, and among employees, 7 severe and 23 mild cases. The incidence of cases was 1.7 per cent in the entire institution. It was 1.4 per cent in inmates and 3.7 per cent in employees (Table 1). An average of 9.7 stools was examined per individual among the employees and 7.3 among the inmates.

TABLE 1  
Number and Per cent of Cases and Carriers

	Number in Institution	Cases						Carriers		
		Severe Cases		Mild Cases		Total Cases		Number Examined	No. of Carriers	Per cent Carriers
		No.	Per cent	No.	Per cent	No.	Per cent			
Employees	808	7	0.9	23	2.8	30	3.7	638	35	5.5
Inmates	4,767	28	0.6	37	0.8	65	1.4	1,184	89	7.5
Total	5,575	35	0.6	60	1.1	95	1.7	1,822	124	6.8

When the 65 cases in the inmates were broken down by wards according to the type of inmate, it was found that there were 30 wards with mild mental cases whose hygienic habits were good. These had a census of 2,674 and 16 cases of dysentery, an attack rate of 0.6 per cent. The moderately deteriorated inmates, whose sanitary habits were rated as fair, were housed in 13 wards with a census of 698; 9 cases of dysentery occurred, giving an attack rate of 1.3 per cent. The most severely deteriorated cases, with poor hygienic habits, were housed in 29 wards with a census of 1,395. The largest number of cases, 40 was reported from these wards; the attack rate was 2.9 per cent (Table 2).

TABLE 2  
*Cases in Inmates According to Their Mental Deterioration*

Type of Inmate	No. of Wards	Census	No. of Cases	Attack Rate Per cent
Mild Mental				
Habits good	30	2,674	16	0.6
Moderate Mental				
Habits fair	13	698	9	1.3
Severe Mental				
Habits poor	29	1,395	40	2.9
Total	72	4,767	65	1.3

More than half the cases in inmates occurred in the connected buildings R and S. Analysis of the cases in these buildings shows the same difference as in the hospital as a whole. The population in the wards reserved for the mild and moderate mental cases, with good or fair sanitary habits, was 534 and that in the wards with the severely deteriorated cases, with poor sanitary habits, was nearly the same, 546. Yet, only 6 cases occurred in the former group, a morbidity rate of 1.1 per cent, while 30 cases occurred among the latter, a rate of 5.3 per cent.

There were 30 employees who had dysentery. Half of them worked as attendants on wards, fairly well scattered in all the buildings. The others

worked in various occupations in the institution, as painters, carpenters, chauffeurs, etc. The latter had no close association with patients on the wards. The dates of onset in the 30 cases were spread over a 6 month period, from December, 1942, to June, 1943. One small group of 4 painters and a carpenter who ate together in the dining room of kitchen 1, became ill at about the same time. They had little or no contact with patients. It appears that this was a small food-borne outbreak.

CARRIERS

Stool specimens were obtained from 1,822 symptomless individuals in the institution, of whom, 1,184 were inmates and 638 employees. The incidence of amebiasis was found to be 7.5 per cent in the inmates and 5.5 per cent in the employees. It was 6.8 per cent in the entire group surveyed (Table 1). An average of 2.6 specimens was examined per inmate, and 3.2 specimens per employee.

OCCUPATION

There were 374 inmates and 116 paid employees working in the kitchens. Of the inmates, 283 were helpers, 1 was a cook, 10 were bakers, 5 butchers, and 75 waitresses. Of the paid employees, 69 were helpers, 18 cooks, 4 bakers, 2 butchers and 23 waitresses. An average of 3.3 stool specimens per food handling employee and 3.6 specimens per food handling inmate was examined. Examination revealed 7 carriers among the paid employees, a rate of 6 per cent, and 52 among the inmates, a rate of 13.9 per cent. Paid employees who handled food as part of their duties were 65 nurses, with 5 carriers, and 416 attendants, with 22 carriers. The total carrier rate among paid employees who handled food as a sole or partial occupation was 5.7 per cent. One carrier was found among 41 paid employees who did not handle food, a rate of 2.4

TABLE 3  
*Carriers According to Occupations*

	<i>Inmates</i>			<i>Paid Employees</i>		
	<i>Total Number</i>	<i>No. of Carriers</i>	<i>Rate Per cent</i>	<i>Total Number</i>	<i>No. of Carriers</i>	<i>Rate Per cent</i>
Food handlers						
Kitchen Helpers	283	39	13.8	69	4	5.8
Cooks	1	0	0.0	18	1	5.5
Bakers	10	0	0.0	4	1	25.0
Butchers	5	2	40.0	2	0	0.0
Waitresses	75	11	14.6	23	1	4.3
Total	374	52	13.9	116	7	6.0
Nurses	0	0	0.0	65	5	7.7
Attendants	0	0	0.0	416	22	5.3
Total food handlers	374	52	13.9	597	34	5.7
Non-food handlers	810	37	4.6	41	1	2.4
Total employed	1,184	89	7.5	638	35	5.5

per cent. In 810 non-food handling inmates, the carrier rate was 4.6 per cent (Table 3). The number of stool specimens examined per individual was about the same in the food handling as in the non-food handling employees, 3.3 and 3.0 respectively. In the case of inmates, almost twice as many stools were examined per food handling as per non-food handling individual, 3.6 and 1.9 respectively.

#### DURATION OF EXPOSURE

An attempt was made to determine the effect of the length of time spent in the institution on the incidence of the carrier state. As will be seen by reference to Table 4, no significant increase in the carrier rate occurred with increase in the length of residence.

#### AGE AND SEX

The distribution of inmates and employees in the institution according to age and sex during the period of study was not available to us. The only figures giving sex distribution of inmates available were those of the admissions of inmates for the fiscal year 1941-1942. There were 396 males and 509 females, 45 and 55 per cent respectively. The same sex distribution obtained among the 89 inmates and the 35 employees who were carriers. However, of the 65 cases that occurred in inmates, and also of the 30 cases in employees, 60 per cent were in males and 40 per cent in females.

The age distribution for inmates admitted in the fiscal year 1941-1942, as well as the age distribution of cases and

TABLE 4  
*Number and Per cent of Carriers According to Length of Time in Institution*

<i>Duration of Exposure</i>	<i>Number Examined</i>			<i>Number Carriers</i>			<i>Per cent Carriers</i>		
	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
1-3 months	109	69	40	9	6	3	8.3	8.7	7.5
3-6 months	80	38	42	2	0	2	2.5	0	4.8
6-12 months	176	66	110	8	1	7	4.5	1.5	6.4
0-1 years	365	173	192	19	7	12	5.2	4.0	6.3
1-2 years	227	65	162	10	2	8	4.4	3.1	4.9
2-3 years	177	54	123	12	5	7	6.8	9.3	5.7
3-5 years	202	70	132	10	4	6	5.0	5.7	4.5
5 years +	947	422	525	73	32	41	7.7	7.6	7.8
Total	1,918	784	1,134	124	50	74	6.5	6.3	6.5



TABLE 5

Admissions to Institution, Fiscal Year 1941-1942; and Cases and Carriers in the Study Period, May, 1942-August, 1943, by Age

Age	Admissions		Cases		Carriers	
	Number	Per cent	Number	Per cent	Number	Per cent
0-19	38	4.2	0	0	0	0
20-29	88	9.7	11	16.9	6	6.7
30-39	127	14.0	10	15.3	28	31.4
40-49	151	16.6	14	21.5	25	28.0
50-59	136	15.0	18	27.7	18	20.2
60-69	164	18.1	6	9.2	10	11.2
70+	201	22.2	6	9.2	2	2.2
Total	905	100.0	65	100.0	89	100.0

carriers among inmates during the study is given in Table 5. About 50 per cent of all cases and carriers occurred in the 40 to 60 age groups, although these made up about 30 per cent of the admissions. There were no cases nor carriers in the 0-19 group. The older group, 60 and over, accounted for 40 per cent of all admissions, but only 18 per cent of all cases and 13 per cent of all carriers.

#### RESULTS OF STOOL EXAMINATIONS

In Table 6 are listed the intestinal parasites found in the stools of the 1,917 individuals examined. Two or more parasites were not infrequently found in the specimen of the same individual. The commonest parasite found was *Entamoeba coli* (29.8 per cent); the next most common was *Entamoeba histolytica* (11.5 per cent). Then followed *Enterobius vermicularis* (3.4 per cent), *Giardia lamblia* (2.7 per cent), *Endolimax nana* (2 per cent), *Iodamoeba butschlii* (1.3 per cent) and *Trichomonas hominis* (1 per cent).

Sawitz and Faust<sup>7</sup> have pointed out that the probability of finding parasites in the stools increases with the number of specimens examined. Intestinal parasites were found in 753 of the 5,882 specimens examined from 1,917 individuals. An analysis was made of the number of stools that had to be examined from each individual before parasites were found. There

were 219 stool specimens positive for *Entamoeba histolytica*. With a single examination, 61.5 per cent of all positives were discovered. The examination of a second stool specimen added 19 per cent. A third stool examination brought the total up to 93 per cent, a fourth specimen to 97.6 per cent, and a fifth to 98.5 per cent. The other intestinal parasites listed in Table 6 were recovered from 711 fecal specimens. A first examination discovered 66 per cent; a second stool specimen, 83 per cent; a third specimen, 94 per cent; a fourth specimen, 96 per cent; and a fifth, 98 per cent.

It should be pointed out that our results are not at all comparable to those of Sawitz and Faust. They ex-

TABLE 6

Number and Per cent of 1,917 Individuals Examined, Harboring Intestinal Parasites

Name	Number	Per cent
Protozoa—		
<i>Entamoeba histolytica</i>	219	11.5
<i>Entamoeba coli</i>	571	29.8
<i>Endolimax nana</i>	39	2.0
<i>Dientamoeba fragilis</i>	1	.05
<i>Iodamoeba butschlii</i>	24	1.3
Flagellates—		
<i>Giardia lamblia</i>	51	2.7
<i>Chilomastix mesnili</i>	4	.2
<i>Trichomonas hominis</i>	20	1.0
Helminths—		
1. Roundworms		
A. <i>Enterobius vermicularis</i>	65	3.4
B. <i>Trichuris trichiura</i>	9	.5
C. Hookworm	1	.05
D. <i>Strongyloides stercoralis</i>	2	.1
E. <i>Ascaris lumbricoides</i>	3	.2
2. Tapeworms		
A. <i>Hymenolepis nana</i>	2	.1

amined an equal number of specimens from each individual and arrived at an index of efficiency by getting a ratio between the number of specimens found positive and the number examined from each of the positive individuals. Since we began treatment as soon as an individual was reported positive, such a calculation would have been biased. We therefore report the number of specimens examined from each individual before a positive was obtained. Our percentages are necessarily higher than those of Sawitz and Faust. With the same technic, they obtained 21 per cent positives in a first examination, and 38, 51, 61, 69, and 76 per cent positive with a second, third, fourth, fifth, and sixth examination.

#### HOUSEHOLD CONTACTS

Since a considerable number of employees lived with their families outside the institution, a follow-up study was made of 48 household contacts to 26 employees who were cases or carriers. None had symptoms of dysentery. Three stool specimens were examined from each. No amebae were found.

#### TREATMENT

Patients with amebic dysentery were hospitalized, isolated in one wing of the sick-bay and were given one injection of emetine hydrochloride (0.06 gm.) per day for 3 days. Chiniofon therapy was instituted concurrently with the emetine hydrochloride and carried through for 10 days. Twelve tablets of 0.25 gm. each were given per day as the usual dosage. On the 7th and 8th day, cold stool specimens and on the 9th day a warm stool specimen, following a saline cathartic, were examined to determine the presence of amebae. A 4 day rest period was instituted from the 11th through the 14th day, following which one tablet of carbarsone (0.25 gm.) was administered four

times a day for a period of 10 days. In weak or malnourished patients, the dosage was reduced to one tablet two or three times per day. The carbarsone therapy ended on the 24th day from the beginning of the chiniofon treatment. On the 26th and 27th days, cold stool specimens were submitted and on the 28th day a warm stool specimen was examined. If these specimens were negative, the treatment was discontinued if the patient had been a carrier. If the patient had been an active case, a course of diodoquin, twelve tablets of 0.2 gm. each per day, was administered in addition for a period of 7 days. On the 25th day after the institution of therapy, in active cases, treatment was ended, provided a cold and a warm post-cathartic stool specimen were negative for amebae.

TABLE 7

*Number of Specimens Examined from Each of 1,917 Individuals*

<i>Number of specimens</i>	<i>Number of Individuals</i>
1	558
2	194
3	736
4	162
5	63
6	37
7	37
8	37
9	35
10	26
11	17
12	6
13	5
14	1
15	1
24	1
26	1
5,882	1,917

A clinical and laboratory cure was obtained in all cases. Two stool specimens were examined from each case and carrier every 6 months after cessation of treatment. The zinc flotation method of Faust was used. Two of the amebic dysentery carriers were found to have *Entamoeba histolytica* cysts, one 15 months and one 10 months after cessation of treatment. Neither patient complained of gastrointestinal

symptoms at any time during the period of observation. Four of the amebic dysentery cases had recurrent attacks of diarrhea. Stool specimens of each of these cases were positive for trophozoites of *Entamoeba histolytica*. In one case the diarrhea occurred 11 months after the original attack, in two cases 13 months, and in one 15 months afterward. Furthermore, 3 other individuals who had had amebic dysentery were found to be symptomless carriers of *Entamoeba histolytica* cysts approximately one year later. Thus of a total of 219 cases and carriers treated, there were 9 recurrences; in 5 as symptomless carriers, and in 4 as clinical cases.\*

#### DEATHS

There were 10 deaths, all preceding the institution of the program of treatment as outlined above. Seven had received no treatment for the amebiasis, 2 had received some treatment with emetine, and 1 with emetine and acetarsone. Eight were autopsied. Seven showed advanced ulcerative lesions of the colon. In 2 cases there was a rupture of the gut with localized peritonitis; in 2 others, there was matting of the gut with localized peritonitis at the site of a deep seated ulcer. Three had ulcerations of the gut, but no rupture. Liver abscess occurred in 1.

Nine of the deaths were in males and one in a female. Three were in age group 40-50, 3 were 59 years old, one was 63, one 64, one 72, and one 80 years of age.

#### COMMENT

The attack rate of cases in inmates was significantly higher on the wards where severely deteriorated mental cases were kept than on the wards where the milder mental cases resided. Since the hygienic habits of the former

were very poor while those of the latter were fairly good, it appears likely that person to person contact played a large part in the spread of infection. This does not appear so obvious in the group of employees with dysentery. However, except in the small group of four painters and a carpenter, there is no evidence of an explosive outbreak such as occurs in common source epidemics. It is not improbable, nevertheless, that some of the other employees were infected in the dining room through the medium of food prepared or handled by one of the many carriers who worked there.

The sudden increase in cases in February and March was apparently due to better reporting of cases of diarrhea, together with the designation of all such cases "amebic dysentery" if *E. histolytica* trophozoites were found in the stool. There was not a comparable increase in the incidence of "severe" cases of amebic dysentery (Chart 1).

The carrier rate of 6.5 per cent in the entire group examined was not unduly high in comparison with carrier rates even in uninstitutionalized groups. Craig<sup>13</sup> reports an average of 11.6 per cent in 18 different surveys in the United States. Weinrich and Arnett<sup>5</sup> reported a 10.7 per cent prevalence in food handling student helpers, and 8 per cent among the food handling employees of a professional school in Philadelphia. Rasanicke and Palmer,<sup>6</sup> however, in a survey of 2,000 patients and 667 food handlers at the University of Chicago clinics reported 1.8 per cent of the patients and 2.4 per cent of the food handlers with amebiasis. Only one stool was examined for each individual. These rates would unquestionably have been higher had more than one stool specimen been examined and had the zinc flotation method of Faust been used.<sup>7</sup> These authors and others have reported a

\* These cases and carriers may not have been recurrences but reinfections.

higher carrier rate in males than in females. Other surveys<sup>2, 8</sup> have indicated the opposite. There is some evidence<sup>9, 10</sup> to support the thesis that ulcerative lesions exist in carriers differing only in degree from those found in patients presenting definite symptoms of the infection, and that extensive lesions may exist without production of symptoms. It is likely, however, that most carriers present only superficial areas of necrosis of the mucous membranes which are rapidly healed. James and Deeks,<sup>11</sup> however, and Andrew and Atchley<sup>12</sup> believe that *E. histolytica* takes on pathogenicity only when it invades the tissues and that this is by no means a constant occurrence.

Although the case incidence was higher in employees than in inmates—3.7 as against 1.4 per cent—it is doubtful if the difference is real. Not all inmates were equally exposed, and it is quite possible that a number of inmates who were counted in the total population on which case incidence was based were never exposed. Second, it is possible that employees were more concerned, and reported mild diarrheas more regularly than the inmates. Third, an average of 9.7 stool specimens were examined from every case in the employees, and 7.3 from every case in inmates. As regards carriers, the difference in rates between employees and inmates—5.5 and 7.5 per cent—is not statistically significant. There is also no significant difference in rates between the food handling and non-food handling employees. There is a significant difference between the rates in food handling and non-food handling inmates. However, that difference might be due to the fact that on an average nearly twice as many specimens were examined from each food handling employee as from each non-food handling employee.

Regardless of other considerations

such as economic or administrative feasibility, the fact that 13.9 per cent of the food handling inmates were carriers of *Entamoeba histolytica* raises the question of the wisdom of employing such individuals as food handlers.

#### SUMMARY

1. An investigation of amebiasis was carried on in a state institution from December, 1942, to August, 1943. There were found 95 cases in a total population of 5,575 inmates and employees, and 124 carriers in 1,822 well persons surveyed. Ten deaths occurred, all before the institution of a program of intensive treatment. There was no indication that the infection was water-borne. There was a significant difference in case rates between inmates with poor sanitary habits and those with good or fair habits. About 14 per cent of the 374 inmates employed as food handlers and 6 per cent of the paid employees who handled food for others were found to be carriers. It is believed that the infection was spread by person to person contact, and possibly also through the medium of food. A small explosive outbreak, apparently food-borne, occurred in a group of five employees. It is pointed out that inmates of a mental institution are ill equipped to appreciate the importance of personal hygiene, and had better not be employed in food handling occupations.

#### REFERENCES

1. Faust, E. C. The Prevalence of Amebiasis in the Western Hemisphere. *Am. J. Trop. Med.*, 22: 93-105 (Jan.), 1942.
2. Spector, B. K., and Hardy, H. V. Studies of the Acute Diarrheal Diseases. *Pub. Health Rep.*, 54:1105-1113 (June 23), 1939.
3. Headlee, N. W. Intestinal Parasite Infections among Patients of the Indiana University Medical Center Hospital. *Am. J. Trop. Med.*, 22:341-350 (May), 1942.
4. Beltoan, E., and Lorenas, R. Protozoarias Intestinales en una Comunidad Escolar de la Ciudad de Mexico (Intestinal Protozoa of a School Community in Mexico City). *Rev. Inst. Salubridad y Enfermedades Trop.* Mexico, 2:193-212 (Sept.), 1941.
5. Weinrich, D. H., and Arnett, J. H. Results of a Protozoological Survey of Foodhandlers at a Professional School in Philadelphia. *Am. J. Trop. Med.*, 22:107-115 (Jan.), 1942.
6. Rodaniche, E., and Palmer, W. L. Current Experiences with *E. Histolytica* Infection in Chicago. *Illinois M. J.*, 81:458-463 (June), 1942.
7. Sawitz, W. G., and Faust, E. C. The Probability of Detecting Intestinal Protozoa by Successive Stool Examinations. *Am. J. Trop. Med.*, 22:131-136 (Mar.), 1942.
8. Massie, F. M. Endemic Amebiasis. *Internat. Clin.*, 2:207-216 (June), 1941.
9. Craig, C. F. The Pathology of Amebiasis in Carriers. *Am. J. Trop. Med.*, 12:285-299, 1932.

10. Hiyeda, K., and Suzuki, M. Pathological Studies of Human Amebic Ulcers, Especially Those of Carriers. *Am. J. Hyg.*, 15:809-823 (May), 1932.

11. James, W. M., and Deeks, W. E. The Etiology, Symptomatology and Treatment of Intestinal Amebiasis. *Am. J. Trop. Med.*, 5:97-136 (Mar.), 1925.

12. Andrews, J., and Atchley, F. Negative Occult Blood Tests in Carriers of the Dysentery-producing Endamoeba Histolytica. *J.A.M.A.*, 99:1340-42 (Oct. 15), 1932.

13. Craig, Charles E. *Amoebiasis and Amoebic Dysentery*. Thomas, 1934, Ch. III, p. 45.

ACKNOWLEDGMENT: We are indebted to Dr. James E. Perkins, Director, Division of Communicable Diseases, and Dr. Robert F. Korn, Epidemiologist, New York State Department of Health, for their active coöperation in this study.

## Existing Permissive Health Unit Legislation

The historical pattern of local health service in the United States is the city, town, village, or township, except in some of the western and southern states where county organization is the rule. *Local Health Units for the Nation*, the report of a two year study by an Association committee, finds this an anachronistic pattern for the present day of large population aggregations, speed of transportation, and interdependence of urban and rural areas.

It suggests that no unit of local government below the county level should undertake to organize its own local health department, that a city and the surrounding rural area in the county have a single unit of local health jurisdiction, and that counties having populations well below 50,000 should join with some of their neighbors to form a district health unit of at least 50,000 persons. This is the smallest population that the committee believes can support a local health service, including a full-time medically trained health

officer, one public health nurse per 5,000 population, one engineer and one sanitarian per 50,000 population, one clerk per 15,000 population, and dental health service. Thus it suggests 1,197 units for the 3,070 counties, an average of nearly three counties per unit.

Even were political, financial, and personnel factors presently favorable, existing legislation of some states does not authorize, though it seldom specifically prohibits, city-county or multi-county health units. In a study of existing legislation, the U. S. Public Health Service found in 1944 that one state had a legal mandate and 21 states authorization for multi-county health units. 5 states for county but not multi-county units, and 7 states for the formation of health districts by one or more contiguous towns or cities; 14 states had no provision for county or multi-county health units. In 3 of these, permissive legislation was enacted in 1945. In a number of other states such bills were introduced but not passed.

# Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum\*

JOSEPH ZICHIS, PH.D., AND HOWARD J. SHAUGHNESSY,  
PH.D., F.A.P.H.A.

*Division of Laboratories, Illinois Department of Public Health, Chicago, Ill.*

IN 1940 we published our studies<sup>1</sup> on the treatment of experimental Western equine encephalomyelitis with specific hyperimmune rabbit serum. The results reported in our paper showed that about 70 per cent of the animals were successfully treated when serum was administered in sufficient quantity after visible signs of the disease were noted.

Both before and after the publication of our studies, other reports have been made on serotherapy in Western equine encephalomyelitis.

In 1932 Howitt<sup>2</sup> described her studies on the use of antiserum in experimental Western type of the disease. She employed serum that was prepared in rabbits and found it was effective in preventing death in guinea pigs when given 4 hours after intracerebral inoculation of virus. When guinea pigs were given serum 48 hours after intranasal instillation of the virus, they survived.

It is regrettable that Howitt did not describe the disease condition of the animals at the time she gave them serum, as it would be important to know if they showed signs of the disease at that time.

Wyckoff and Tesar<sup>3</sup> were unsuccessful in their attempts to treat monkeys with serum when treatment was begun after the onset of fever. Two 10 ml. doses of antisera prepared in horses were given each animal. We believe that their failure was probably due to the insufficient quantity of serum used.

Fulton<sup>4</sup> reported that he was not able to prevent death in guinea pigs with horse antiserum after they were injected intracerebrally with Western virus. It is not possible to discuss his results because protocols were not given. It may be said, however, that a very severe fulminating type of disease, which would be very difficult to treat by any means, follows the inoculation of guinea pigs with virus by the intracerebral route.

Traub<sup>5</sup> reported that he was able to prevent death in guinea pigs with antiserum in the early stages of the disease resulting from inoculation with either Western or Eastern virus by the plantar route. Following this method of inoculation the disease exhibited a diphasic febrile reaction. Traub's results are of special interest because he was able to effect successful treatment in the early stages of the disease by giving each of his animals about 1 ml. of serum. This is a very small quantity of serum compared to that used by us. In our previous studies we found that from 15 ml.

\*Based upon a paper presented at a Joint Session of the Health Officers, Laboratory, and Epidemiology Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

to 70 ml. of serum gave good results in the treatment of guinea pigs but in the experiments reported here more consistent results were obtained with quantities of 15 ml. to 125 ml.

More recently Olitsky and his co-workers<sup>6</sup> reported that in their studies they were unable to treat Western equine encephalomyelitis effectively with antiserum in guinea pigs and mice after the onset of signs of encephalitis. Also they could not prevent death in mice when serum was given 24 and 45 hours after the virus. In these experiments the guinea pigs were given virus by the intralingual route and the mice by the intracerebral.

It is very difficult to analyze the results in this part of their publication because protocols were not given for two of the three treatment experiments and because their experimental procedures were not the same as ours. It is believed, however, that their failure to obtain preventive or therapeutic effects with antiserum may be explained on the basis that they used a low potency serum in the preventive experiments and that small quantities of serum compared with the quantities used by us were employed in the treatment experiments. In addition they gave serum by the subcutaneous route to mice 3 to 5 days after intracerebral injection of virus. After this interval of time the antibody should have been made readily available to combat the infection, but instead the serum was given by a route in which absorption is slow.

They also treated guinea pigs with one to three 1 ml. doses of serum starting 48 hours after inoculation of virus into the pads. At this time the animals were either in the first febrile phase or the afebrile interphase. Of 7 animals that received from 2 to 3 doses of serum 6 survived. When only one dose of serum was given, 2 of 4 animals died of the infection. These results indicate to us that serotherapy was effective

in treating the disease in its early stages. They also bear out our observation that with larger quantities of serum, treatment is more effective.

Recently serotherapy has been employed in human Western equine encephalomyelitis. Gold and Hampil<sup>7</sup> reported the results of treatment of a patient who was accidentally infected with the Western virus. The patient was given 1,595 ml. of horse antiserum over a period of 5 days. Progressive improvement followed the administration of the serum up to the 10th day of the disease. At this time the condition of the patient became worse and 6 days later it was diagnosed as acute Parkinsonism. However, the patient finally recovered without showing any signs of definite damage of the central nervous system. Four months after onset of the disease the patient's serum showed a very high titer of the specific antibody.

During the Saskatchewan epidemic of Western equine encephalomyelitis in 1941,<sup>4</sup> specific serum of horse origin was used for treatment. According to the author, the effectiveness of the serotherapy was inconclusive. The report, however, states that 2,780 ml. of serum were given to 116 patients, indicating that small quantities of serum were given to each individual case. In addition, it is stated that of the 12 fatal cases 5 were given serum when they were moribund. Possibly the inconclusive results of treatment with serum were due to the fact that small quantities of serum were used and that some of the patients were given serum late in the course of illness.

This study deals with the treatment of experimental Western equine encephalomyelitis in guinea pigs and rhesus monkeys with specific hyperimmune rabbit serum. In the guinea pigs the treatment was begun when they showed visible signs of the disease and in monkeys at the onset of fever.

## MATERIALS AND METHODS

*Virus*—The Kelsner strain of Western equine encephalomyelitis virus was used in these studies. It was obtained in January, 1939, from Dr. Carl TenBroeck of the Rockefeller Institute for Medical Research and was maintained in this laboratory by serial intracerebral passages in guinea pigs.

*Animals*—Guinea pigs each weighing from 400 to 550 gm. and rhesus monkeys each weighing about 4 kg. were used for the serum treatment studies. Swiss mice of about 16 gm. weight were employed in the determination of the virulence of the virus and the potency of the antiserum.

*Production of Western Equine Encephalomyelitis Antiserum*—The virus used for the production of the antiserum was propagated in the developing hen's egg. After 11 days of incubation the eggs were inoculated with the virus and then reincubated until the embryos died. Usually they died about 18 hours after inoculation. The dead embryos were removed from the eggs and ground in a tissue mill. The ground tissue was adjusted to a 20 per cent suspension with buffered physiological solution of sodium chloride. The virulence of this virus was such that 0.03 ml. of the  $10^{-8}$  to  $10^{-10}$  dilution produced death in mice inoculated by the intracerebral route.

The immunization of the rabbits was carried out by injecting them intravenously on Monday, Wednesday, and Friday of each week with 20 per cent suspension of the living virus. The following schedule of immunization was employed for each animal: two 0.1 ml., two 0.25 ml., two 2 ml., two 5 ml. doses; all subsequent doses were 10 ml. It was found necessary to inoculate each rabbit with 10 ml. of the virus three times a week for at least 12 to 16 weeks before a serum of high potency could be obtained.

The serum was bottled without a

preservative. It was found necessary to heat the serum at  $56^{\circ}\text{C}$ . for 30 minutes just before it was used therapeutically because the unheated serum produced severe serum reactions in a large per cent of the sick guinea pigs.

*Potency Determination of the Antiserum*—Swiss mice were used for these tests. Each of 12 mice was injected subcutaneously with 1 ml. of one of the following dilutions of the serum: undiluted 1-10; 1-500; and 1-1,000. The dilutions of serum were made with physiological solution of sodium chloride. Sixteen hours after the administration of the serum each mouse was injected intracerebrally with about 5 m.l.d. of the virus. To demonstrate the virulence of the virus, 12 normal mice were similarly injected with the same virus preparation. The mice were kept under observation for 20 days following the injection of virus.

Virus derived from an infected guinea pig brain was employed in the serum potency tests. The m.l.d. of the virus was predetermined and the dilutions containing the desired number of m.l.d.'s were stored in dry ice at about  $-70^{\circ}\text{C}$ . Under such conditions the virulence of the virus did not change for at least 4 months.

The potency of the antiserum was expressed in terms of mouse protective units per ml. The end point was considered as that dilution of the serum which protected at least two-thirds of the mice, provided that in the lower dilutions at least two-thirds of the mice were protected and all of the control mice died. The unit value was established in the following manner: If 1 ml. of a 1-500 dilution of a serum protected at least two-thirds of the mice, the serum was considered as having 500 mouse protective units per ml. If the antiserum protected only two-thirds of the mice when given undiluted, it was regarded as having one unit per ml.



## EXPERIMENTAL

## TREATMENT OF GUINEA PIGS

In these experiments the guinea pigs were treated with Western equine encephalomyelitis antiserum only when they were visibly sick. An animal was adjudged visibly sick if it showed the following: rough hair, humped position, sagging abdomen, anorexia, evidence of pain upon movement, weakness and fever. In addition to these signs most of them, when treatment was started, also showed ataxia and a few, paralysis. The majority of the animals were treated with serum at the time ataxia was first observed. However, in a few cases the animals received treatment before they showed ataxia. These animals were very sick and without treatment usually became prostrated and died without showing obvious signs of central nervous system involvement. Usually the animals that received treatment before showing ataxia, developed this condition and in a few cases paralysis before they began to recover.

*Experiments 1 to 7*—Before the guinea pigs were used for the experiments, they were kept under observation for about 20 days. The normal temperature of each animal was determined by recording it for about 4 to 6 consecutive days prior to the experiment.

The guinea pigs were inoculated by the intralingual route with a suspension prepared from a virus infected guinea pig brain. In Experiments 1 and 2 each animal was given 0.4 ml. of a 1-100 dilution of the virus whereas in Experiments 3 to 7 0.15 ml. of a 1-10 dilution was employed. These amounts of virus produced definite signs of infection in about 90 per cent of the experimental and control guinea pigs.

After the animals were exposed to the virus their temperatures were taken twice a day and they were watched very

closely for signs of the disease. Excitability was usually the first sign that could be observed. As a rule it preceded fever by about 20 hours. The guinea pigs usually showed a rise in temperature for about 24 hours before they became visibly sick.

The antiserum was administered to the animals by the intraperitoneal route for the first 2 or 3 days of the illness and then by the subcutaneous route until recovery was complete. The quantity of serum that was used depended on the severity of the disease and how the animal responded to therapy. From 15 ml. to 125 ml. of serum was used to treat a guinea pig, the average amount being about 85 ml. In addition to giving the animals specific serum as it was needed, they were given supportive treatment. When the sick animals refused food, they were fed by placing thin slices of carrot in their mouths and were given water through a medicine dropper. In some cases normal saline solution was administered either by the subcutaneous or intraperitoneal route. In addition the animals were quartered in a thermostatically controlled room.

To avoid aggravation of the disease condition the temperatures of the guinea pigs in Experiments 1, 2, and 3 were taken only up to the time serum therapy was begun. Thereafter the signs of the disease were recorded for an additional 30 days, excepting for those that were killed earlier for histopathological studies. In Experiments 4 to 7 the temperatures were taken for the first 18 days of the experiment, after which the animals were kept under observation for an additional 37 days.

The control guinea pigs in Experiments 1, 2, 3, and 7 were given only supportive care whereas those in Experiments 4, 5, and 6 in addition to the supportive care were given normal rabbit serum. The quantities of normal serum used were equivalent to those of

G.P.	Observer	Aver. Days Norm.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	55
1	Temp.	2.2	2.2	2.0	2.5	2.2	3.0	4.1	3.0	2.4	3.0	4.2	3.4	3.2	3.2	2.7	2.4	2.4	2.2	2.7	Not
	Cond.	N	N	N	H	S	SA	S	SA	S	SI	S	S	I	I	R	N	N	N	N	Imm.
	Treat.	-	-	-	-	-	25ip	20ip	10ip	10ab	5ab	-	-	-	-	-	-	-	-	-	-
2	Temp.	2.6	2.0	2.0	4.2	2.6	2.0	1.8	2.0	2.0	2.6	2.2	1.9	2.2	2.4	2.1	2.5	2.5	2.6	2.3	Imm.
	Cond.	N	N	N	SA	S	SI	SI	R	N	N	N	N	N	N	N	N	N	N	N	-
	Treat.	-	-	-	15ip	15ip	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Temp.	1.8	2.4	2.3	2.4	3.0	4.5	3.0	2.4	2.4	1.9	2.0	2.0	2.0	2.4	2.1	2.4	2.4	2.7	1.7	Imm.
	Cond.	N	N	N	H	S	SA	SA	S	SI	I	I	I	R	N	N	N	N	N	N	-
	Treat.	-	-	-	-	-	25ip	20ip	10ab	5ab	-	-	-	-	-	-	-	-	-	-	-
4	Temp.	2.2	2.2	2.3	3.2	4.2	4.0	3.0	3.0	3.0	3.2	2.1	1.5	2.7	2.1	2.5	2.7	2.7	2.0	2.0	Imm.
	Cond.	N	N	N	E	SA	SA	S	I	I	R	N	N	N	N	N	N	N	N	N	-
	Treat.	-	-	-	-	-	25ip	20ip	10ab	-	-	-	-	-	-	-	-	-	-	-	-
5	Temp.	2.3	2.1	2.2	3.8	5.2	4.4	Ir	3.0	3.1	2.5	2.2	2.1	2.3	3.1	3.1	2.6	2.0	2.0	2.8	Killed
	Cond.	N	N	N	SA	SA	SA	SP	SA	S	SI	R	N	N	N	N	N	N	N	N	-
	Treat.	-	-	-	-	20ip	20ip	25ip	10ab	10ab	5ab	-	-	-	-	-	-	-	-	-	-
6	Temp.	1.5	2.6	2.6	2.8	2.0	3.4	4.5	4.0	2.4	1.8	1.7	3.0	1.9	2.6	2.4	2.7	2.5	2.6	2.7	-
	Cond.	N	N	N	N	S	SA	SA	SP	S	S	SI	I	I	I	R	N	N	N	N	-
	Treat.	-	-	-	-	-	25ip	20ip	20ip	10ab	5ab	-	-	-	-	-	-	-	-	-	-
7	Temp.	1.7	2.0	2.1	3.0	3.6	5.4	4.0	2.4	2.6	3.3	2.7	2.2	1.6	1.9	2.5	2.4	2.6	2.5	2.5	-
	Cond.	N	N	N	N	S	SA	SA	S	SI	SI	I	I	R	N	N	N	N	N	N	-
	Treat.	-	-	-	-	-	25ip	20ip	10ab	5ab	5ab	-	-	-	-	-	-	-	-	-	-
8	Temp.	2.1	2.1	2.3	3.1	4.0	5.9	Ir	1.0	2.0	2.5	3.3	2.9	2.0	3.4	3.3	3.3	3.0	3.5	2.4	-
	Cond.	N	N	N	E	S	SA	SP	SA	S	I	I	R	N	N	N	Ir	Ir	Ir	Ir	-
	Treat.	-	-	-	-	-	20ip	25ip	10ab	10ab	10ab	5ab	-	-	-	-	-	-	-	-	-
9	Temp.	2.2	1.9	2.0	2.9	2.3	4.4	1.0													
	Cond.	N	N	N	E	E	SA	SP	Dead												
	Treat.	-	-	-	-	-	25ip	20ip													
10	Temp.	2.0	2.0	2.0	1.9	3.6	4.8														
	Cond.	N	N	N	E	S	SA	Dead													
	Treat.	-	-	-	-	-	25ip	25ip													
Control Guinea Pigs - No Treatment																					
11	Temp.	1.4	1.9	2.1	2.0	1.7	4.3														
	Cond.	N	N	N	N	E	SA	Dead													
12	Temp.	1.6	2.5	3.1	3.6	3.6	4.5	5.0	3.0												
	Cond.	N	N	N	E	E	S	SA	SP	Dead											
13	Temp.	2.5	2.7	2.6	2.7	2.4	4.0	4.6													
	Cond.	N	N	N	N	E	SA	SA	Dead												
14	Temp.	1.4	2.1	1.6	2.4	3.0	4.4														
	Cond.	N	N	N	N	E	SA	Dead													

N - Normal  
 E - Excitable  
 Ir - Irritable  
 S - Visibly Sick  
 A - Ataxia  
 P - Paralysis  
 I - Improving  
 R - Recovered  
 \* - Virus Injected  
 Temp. of last 2 figures above 100 shown

TABLE 1—EXPERIMENT 7  
GUINEA PIGS TREATED WITH ANTISERUM WHEN VISIBLY SICK

the antisera. Neither the normal rabbit serum nor the supportive treatment yielded any therapeutic effect. As shown in Table 2, 41 guinea pigs were used as controls and of this number only one recovered from the disease.

In addition to the signs of Western equine encephalomyelitis shown by the guinea pigs at the time of treatment with specific serum, other evidence indicated the presence of the disease. In many instances the disease continued to progress even after the start of serum therapy, causing ataxia and in a few cases paralysis before recovery became

apparent. In 34 per cent of the animals the disease continued to progress after treatment was begun, causing death. Histopathologic studies of tissues from the central nervous system were also made of animals that were killed after they had recovered from the disease following serum therapy. The results of these studies will be published elsewhere. Animals that recovered from the infection following treatment with serum were tested for immunity by intracerebral injection of the virus. Eighty-two per cent of those tested were found to be immune, show-

ing that the disease had progressed sufficiently in these animals to produce active immunity.

Olitsky, Schlesinger, and Morgan reported<sup>6</sup> that they were unable to detect immunity in guinea pigs 7 weeks after they were given serum following virus injection. We would like to point out however, that the animals that they tested for immunity were treated with antiserum in the early stages of the disease (the first febrile phase or the afebrile phase) resulting from pad injection of virus. Their findings are in agreement with ours<sup>1</sup>; namely, that guinea pigs did not become immune when they were treated with antiserum in the early stages of the disease (onset of fever) after intralingual virus injection.

The results of Experiment 7 are shown in Table 1. This is a sample protocol.

The summary of the results of these experiments is shown in Table 2. Fifty-five guinea pigs were treated with Western equine encephalomyelitis antiserum after they were visibly sick, and of this number 67.3 per cent recovered. Of the 41 control guinea pigs 40 died and one recovered spontaneously.

TABLE 2

*Treatment of Guinea Pigs with Antiserum When Visibly Sick. Summary of Results*

Exp. No.	Titer of Antisera Units	Treatment When Visibly Sick *	Untreated Controls *
1	1,000	3/4	0/4
2	1,000	5/6	0/6
3	700	5/8	1/3
4	500	7/12	0/10
5	600	5/9	0/9
6	500	4/6	0/5
7	800	8/10	0/4
Number recovered		37	1
Total animals used		55	41
Per cent recovery		67.3%	2.5%

\* Denominator: No. animals tested; numerator: No animals died.

*Experiment 8*—The guinea pigs in this experiment were treated with the purpose of confirming our preliminary

observations that treatment with low potency serum is ineffective.<sup>1</sup> The serum used in this experiment was obtained by hyperimmunization of rabbits for 2 weeks, and its titer was only 1 unit per ml.

Each of the 20 animals was injected intralingually with 0.15 ml. of a 1-10 dilution of guinea pig brain virus. The guinea pigs were divided into 2 groups of 10 each, one used as controls and the other for treatment.

All of the animals in the experimental group developed the disease and were given serum treatment when they were visibly sick. The method of injection and the quantities of the serum used were the same as described in the previous experiments. Of the 10 animals treated only one recovered.

In the control group one guinea pig escaped infection, the other 9 developed the disease and died.

The results of this experiment indicate that an antiserum of low antibody content is of very little value in treating experimental Western equine encephalomyelitis.

#### TREATMENT OF RHESUS MONKEYS

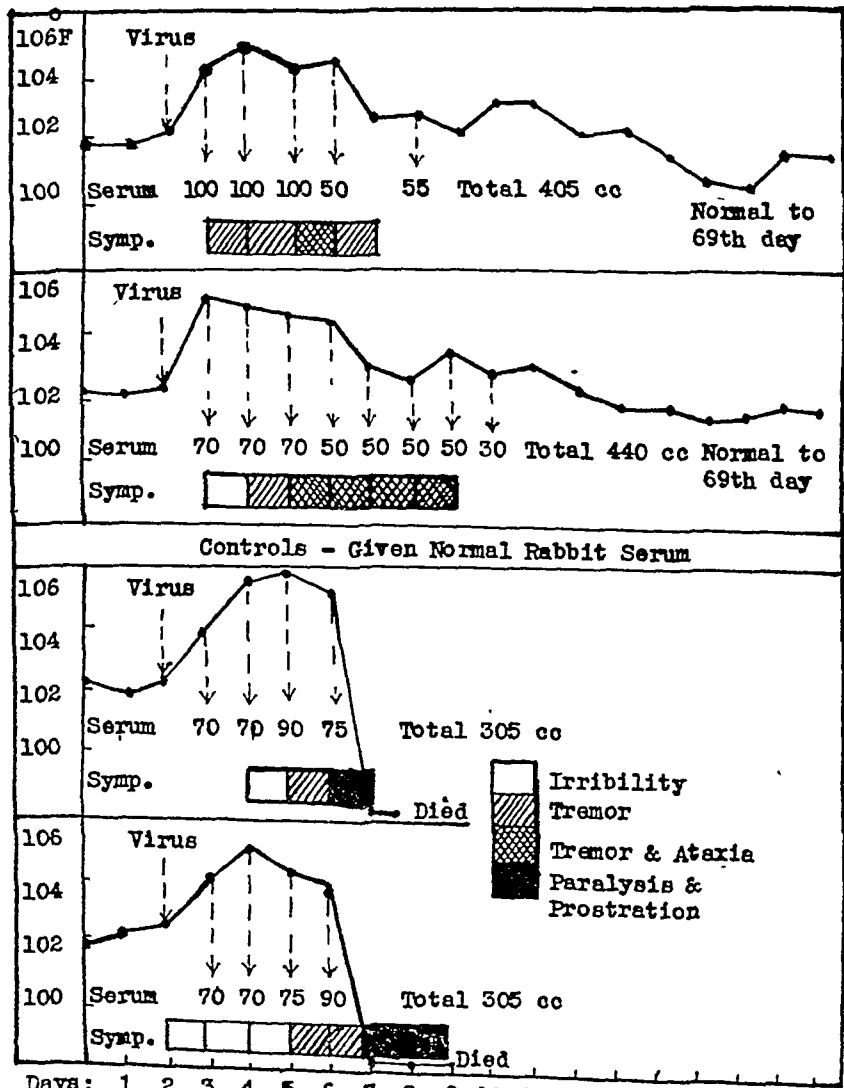
Three experiments were performed with rhesus monkeys. The virus was inoculated by the intracerebral route in doses of 0.1 to 0.25 ml. of a 20 per cent suspension of chick virus. The animals were treated with serum by the intravenous and subcutaneous routes at the onset of fever which usually appeared from 24 to 48 hours after injection of virus. The only other signs that were detectable at this stage were roughened coats, irritability, and in two cases tremors. In the animals that recovered, however, the disease continued to progress after the administration of serum, producing tremors, ataxia, and in one case paralysis before recovery began. The monkeys that recovered received on the average about 475 ml. of serum.

Chart I illustrates the results of successful therapy of 2 monkeys with anti-serum and of treatment of 2 control monkeys with normal rabbit serum.

In these experiments 11 monkeys were treated with serum at the onset of fever and of this number 6 died and 5 recovered. Ten monkeys were used as controls and all of them developed the disease and died. The animals that recovered following serum therapy were observed for 68 days and remained normal after recovery.

DISCUSSION OF RESULTS

The results of these experiments show that we have been able to treat experimental Western equine encephalomyelitis in guinea pigs and rhesus monkeys effectively with specific hyper-immune rabbit serum when treatment was begun after the former showed visible signs of the disease and the latter onset of fever. On the other hand, the results described in the literature indicate that most of the other workers have failed to prevent death in animals



Days: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18  
Chart 1. Experiment 4. Treatment of Rhesus Monkeys with Antiserum at Onset of Fever

with antiserum when treatment was begun after the onset of signs of encephalitis. As we have pointed out, however, most of their studies were carried out either with low potency serum or with inadequate quantities of serum. For example, in the treatment of guinea pigs, Traub<sup>5</sup> gave each animal 1 ml. of serum and Olitsky<sup>6</sup> 10 to 20 ml., while Wykoff and Tesar<sup>3</sup> treated monkeys at the onset of fever with 20 ml. of serum each. In addition, the animals in their studies were not given treatment in the true sense of the word. Serum was not given to the animals when it was needed but was administered to them on a time basis. They did not give supportive treatment to their animals in the form of forced feeding as was done in our experiments.

In our studies we were able to treat guinea pigs successfully after the onset of encephalitis or monkeys after the onset of fever only when adequate quantities of antiserum having a potency of 500 to 1,000 units per ml. were employed. On the average it was necessary to use 85 ml. of serum to treat a guinea pig and 475 ml. to treat a monkey. As shown in Experiment 8, antiserum of low potency (1 unit) was not effective in treating this disease. We also found that supportive treatment was a useful adjunct in treating the disease in animals with specific antiserum.

In our earlier studies<sup>1</sup> we observed that the *in vitro* neutralization method of determining the therapeutic value of Western equine encephalomyelitis antiserum was not reliable; that is, a serum that had a high neutralizing value was not always effective therapeutically. Later Traub<sup>5</sup> confirmed this observation. For this reason we have employed a passive protection test in mice to establish the therapeutic value of an antiserum. The potency of the serum is expressed in terms of mouse protec-

tive units per ml. as described under Serum Testing. In our experience, this test proved to be a reliable method of forecasting the therapeutic value of a given lot of antiserum. Usually sera that tested 500 units to 1,000 units were effective in treating the disease, those of lower potency were not.

Olitsky and his associates reported<sup>6</sup> that by 3 injections of virus in rabbits they were able to obtain an antiserum which was equivalent in potency to that obtained after 46 injections. In our experience however, an antiserum could be produced titrating from 500 units to 1,000 units per ml. only after 12 to 16 weeks of hyperimmunization of rabbits.

Judging from the quantities of antiserum that it was necessary for us to use in order to obtain successful results in treatment, it appears that inadequate amounts of serum have been used by the other investigators. This together with the questionable potency of the serum they employed are in our opinion the greatest factors contributing to their unsuccessful efforts effectively to treat experimental Western equine encephalomyelitis with specific antiserum after the onset of encephalitis. Excepting for some of the antisera employed by Olitsky, et al.,<sup>6</sup> the potency of the serum used by the other workers cannot be compared to that of ours, either because they were unstandardized or because their antibody content was determined by a different method. However, judging from the methods used in the preparation of the sera by most of the other investigators, it is doubtful if their antisera equaled ours in potency.

#### SUMMARY AND CONCLUSION

Fifty-five guinea pigs (Table 2) were treated with specific hyperimmune rabbit serum of 500 to 1,000 units when they became visibly sick following intralingual injections of Western equine encephalomyelitis virus. Of this

number 67.3 per cent recovered. On the other hand, of the 41 guinea pigs used as controls, one recovered spontaneously and 40 died.

Serotherapy was less effective in rhesus monkeys, giving a recovery rate of 45.5 per cent against 0 per cent in the control group. However, these animals were treated with serum at the onset of fever following intracerebral injection of the virus. Since by this method of injection the virus produces a fulminating type of the disease which is obviously more difficult to treat, these results are considered significant.

A Western equine encephalomyelitis antiserum has been prepared by hyperimmunization of rabbits which is effective in treating the experimental disease even after the animals showed evidence of central nervous system involvement. It is believed that the successful treatment of the disease in these

experiments, can be attributed to the use of adequate quantities of antiserum of high potency administered by a route which made the serum antibodies readily available to the animal.

#### REFERENCES

1. Zichis, J., and Shaughnessy, H. J. Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum. *J.A.M.A.*, 115:1071-1078, 1940.
2. Howitt, B. F. Equine Encephalomyelitis. *J. Infect. Dis.*, 51:493, 1932.
3. Wyckoff, R. W. G., and Tesar, W. C. Equine Encephalomyelitis in Monkeys. *J. Immunol.*, 37:329, 1939.
4. Davison, R. O. Encephalomyelitis in Saskatchewan, 1941. *Canad. Pub. Health J.*, 33:388-398, 1942.
5. Traub, E. Serotherapeutic Experiments in Induced Infection of Guinea Pigs with the Virus of American Equine Encephalitis. *Zentralbl. f. Bakt.*, 1 Abt., Orig., 147:81, 1941.
6. Olitsky, P. K., Schlesinger, R. W., and Morgan, I. M. Induced Resistance of the Central Nervous System to Experimental Infection with Equine Encephalomyelitis Virus. *J. Exper. Med.*, 77:359-374, 1943.
7. Gold, H., and Hampil, B. Equine Encephalomyelitis in a Laboratory Technician with Recovery. *Ann. Int. Med.*, 16:3, 1942.

---

## Harmon General Hospital is Tropical Disease Center

Harmon General Hospital, Longview, Tex., was recently designated for the treatment of tropical diseases. The only other army tropical disease center is Moore General Hospital, Swannanoa, N. C. Lt. Col. Francis R. Dieuaide, Chief of the Tropical Disease Branch, Medical Consultants Division, Office of the Surgeon General, stated that the medical staff of Harmon General Hospital has for some time been engaged in a study of relapsing malaria

which has resulted in a permanent contribution to the knowledge of the disease. The study is now being extended to other tropical diseases which are rare in this country, such as filariasis, schistosomiasis and dysentery. Col. Gouveneur V. Emerson is Commanding Officer of Harmon General Hospital, Lt. Col. Worth B. Daniels is Chief of the Medical Service and Lt. Col. Stuart W. Lippincott is Chief of the Laboratory Division.

Aug., 1945

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35

August, 1945

Number 8

C.-E. A. WINSLOW, DR.P.H., *Editor*

LEONA BAUMGARTNER, M.D., *Associate Editor*

ARTHUR P. MILLER, C.E., *Associate Editor*

MAZŮCK P. RAVENEL, M.D., *Editor Emeritus*

MARTIN FROBISHER, JR., Sc.D., *Associate Editor*

JAMES E. PERKINS, M.D., *Associate Editor*

AUGUSTA JAY, *Editorial Associate*

## *Editorial Board*

REGINALD M. ATWATER, M.D.

*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.

KENNETH F. MAXCY, M.D.

HENRY E. MELENEY, M.D.

ALTON S. POPE, M.D.

C.-E. A. WINSLOW, DR.P.H.

## THE WAGNER BILL OF 1945

THE following letter was sent to the editor of this JOURNAL (and to the editors of other journals in the health and medical field) by the Hon. Robert F. Wagner under date of May 31:

On Thursday, May 24, I introduced with Senator Murray a bill S. 1050, entitled: "The Social Security Amendments of 1945." The bill provides for "the national security, health and public welfare." Representative Dingell of Michigan introduced a companion bill (H.R. 3293) in the House at the same time.

I am forwarding the bill itself, and a copy of my speech in the Senate for your information and use.

I particularly invite your earnest study of the provisions of the bill relating to health. There is absolutely no intention on the part of the authors to "socialize" medicine, nor does the bill do so. We are opposed to socialized medicine or to State medicine. The health insurance provisions of the bill are intended to provide a method of paying medical costs in advance and in small convenient amounts.

During the formulation of this bill, we have benefited greatly from the constructive advice and suggestions of practicing physicians, and of physicians in clinical and teaching positions. Their constructive suggestions have resulted in changes in the bill which we presented in the last Congress. Undoubtedly other changes will be made before this bill is enacted into law. We wish to have it known that we invite constructive suggestions from the medical profession.

In addition, members of the medical profession will be given full opportunity to voice their opinions in open hearings when the bill is considered in Committee.

I hope that you will print this letter in your Journal and that you will join me in urging the medical profession to undertake an earnest study of the actual provisions of the bill. In this way you can help immeasurably in avoiding misunderstanding and misinterpretation of the legislation and in stimulating physicians and medical and hospital organizations to come forward with constructive suggestions and advice.

There has been some talk in the past about the failure of congressional leaders to consult with the professions concerned in regard to legislation on medical care. "Consultation" behind closed doors on the basis of deals between pressure groups would not be in the public interest. "Consultation" on the basis of intelligent open discussion on facts and policies is what Senator Wagner seeks. It is to be hoped that his request for counsel may be met on the same high plane, with factual and objective criticism and not with catch-phrases about "socialized

medicine" and nonsense about "the end of freedom for all classes of Americans." This will not be easy in the climate of passion and prejudice which the National Committee of Physicians for the Extension of Medical Service is attempting to create. We believe, however, that the members of the A.P.H.A., at least, will approach the subject in an intellectual rather than an emotional spirit.

The new bill is an omnibus measure of 185 printed pages which correlates and amends many sections of the present Social Security Act to provide a complete and logical program of medical care for the American people.

It includes a modified version of the Hill-Burton Bill for the Development through federal aid of essential hospital and health center facilities, particularly in rural areas. It then proceeds to basic public health services and presents a revision of Titles V and VI of the present Act, incorporating also the essentials of the present venereal disease and tuberculosis control programs. It modernizes existing policies of public assistance with regard to medical care. It then proceeds to set up a wide national program of contributory prepayment for medical care, based on a payroll contribution (one-half from the employee and one-half from the employer). To clarify certain widespread misrepresentations, it should be pointed out that this contribution for medical care amounts to 3 per cent of income, an additional 5 per cent being required for existing programs of retirement, survivors, and extended disability insurance, unemployment insurance, and temporary disability insurance. Also, it should be pointed out that the bill interferes in no way with voluntary hospitals or with the system of medical practice. "Health insurance is simply a method of paying medical costs in advance and in small convenient amounts." Finally, the bill proceeds to provision for the care and rehabilitation of disabled persons.

Aside from its much wider scope, this measure differs from the Wagner Bill of 1943 in its specific provisions for decentralization of administration and for community sharing of responsibility through national and regional Advisory Councils. In the health and medical field it is notable for its emphasis on quality of service and its provisions for assisting in basic research and in the training of personnel.

This measure is now placed before us for criticism. It is a challenge to the fair-mindedness and constructive imagination of the American people—and, particularly, of the members of our *Association*. The provisions for local administration are wisely drawn in flexible form; but they should be carefully checked with the generally sound policies outlined in the memorandum adopted by the A.P.H.A. last fall. It may be a source of regret to some that home nursing service is not provided in the basic insurance plan but left for later study, since many of us believe that the inclusion of such service would involve savings in hospital expense in excess of the costs of nursing.

These, and many other provisions of the bill, should be studied with meticulous care; and it would seem eminently wise for the *Association* to re-activate its Committee on Medical Care for a thorough-going analysis of the problems involved. This measure is probably more vital in its potentialities for the American people than any other item of domestic legislation now before the Congress or likely to come before the Congress for a decade.

As a preparation for such discussion we urge our members to study in detail the text of such parts of S. 1050 as relate to the health and medical field; and also to read Senator Wagner's introductory speech on "Social Security for the American People" delivered before the Senate on May 24, 1945.



## "DIPHTHERIA REBOUNDS"

AN article under the above title by Knud Stowman<sup>1</sup> calls attention to a problem which may prove of direct significance to health administrators in the United States.

Fifteen years ago, diphtheria incidence in the various countries of Western Europe had reached a moderate and reasonably uniform figure, of 50-100 reported cases per 100,000 population. The decade following 1926 showed a decrease in most of these countries but a more or less steady increase in Germany. By 1937-1940, the incidence rate was below 20 in Denmark, the Netherlands, Norway, Sweden, and Switzerland; but it was 212 in Germany. Increasing mass movements of children to camps and neglect of immunization are the two main reasons advanced by Stowman to explain the phenomenon.

From 1939 on, a second disturbing factor appeared. The gravity of the disease began to show a marked increase. In 1937-1938 the German fatality rate was 3.8; in 1940, it was 5.8. Frequently, in spite of immediate and ample serum treatment, death occurred as a result of severe toxic action, often without membrane formation. Fischer recorded 64 per cent of a series of 123 cases showing interstitial myocarditis.

In 1941 the rise of the diphtheria rate in Germany was accelerated; and the disease in its new and virulent form spread in the occupied countries of Norway and the Netherlands with disastrous results. The incidence of diphtheria in the Netherlands rose 40-fold and in Norway 112-fold.

Stowman<sup>2</sup> estimates that there were at least 1,000,000 cases of diphtheria in Europe (outside of Russia). He rightly concludes that "diphtheria has turned out to be the leading epidemic disease of the war on the European continent both as a cause of morbidity and of mortality."

Germany is no longer isolated from us by a barrier of steel. Thousands of soldiers will return from that country or from contact with prisoners from that country. It will be somewhat surprising if some of them do not bring strains of this highly virulent diphtheria to our shores. It behooves us to redouble the strength of our immunization program.

On the whole, this program has been among the most creditable of all our efforts to promote the public health. Reports from the states show only 15,323 cases of diphtheria reported for 1944, lower than the median for 1939-1943. Of these 15,323 cases, however, California contributed 1,318, South Carolina, 1,547, and Texas, 2,031; against 330 for the State of New York. A word to the wise should be sufficient.

### REFERENCES

1. Stowman, K. Diphtheria Rebounds. *Epidemiological Information Bulletin*, UNRRA Health Division. Washington, D. C., 1:157-168 (Feb. 28), 1945.
2. Stowman, K. The Epidemic Outlook in Europe. *Epidemiological Information Bulletin*, UNRRA Health Division. Washington, D. C., 1:101-111 (Feb. 15), 1945.

## THREE "R's" OF ADMINISTRATION

ON a hot afternoon in June, three cronies were chatting over their highballs at the club. Dr. C. O. R. Dinator, the local Health Officer had started the discussion. "Had a hard day. In this weather you sometimes wonder what you're for and what it's all about. My job is administration, yes. But what is

administration? Is it just a mass of petty details? Saying yes or no to this question. Settling that minor squabble between bureau chiefs. Are there any general principles, any broad lines of policy that make a good administrator—or a bad one?"

"There's just one principle of good administration," said Col. R. U. Tine. "That's the clear fixing of administrative responsibility. We've found that out in the Army, and the fact that a lot of one-time civilians like myself have learned this lesson is a good thing for the nation. Lines of responsibility, 'channels,' that's the answer. Every man responsible to someone above him—and the whole pyramid ending in you. Each individual told clearly what he has to do, supported to the limit if he does it, given the works if he fails. So on, all the way down. If you stick to fixed channels of authority, the machine can work. There is nothing worse for any organization than to have a director going over the heads of bureau chiefs to deal with staff directly, to dictate details himself, leaving assistant administrators uncertain of their ground, and failing to support actions performed in good faith. Worse still is the policy of directors who countermand actions, or even reprimand an assistant in the presence of others. Such conduct shakes an organization structure. It is termitic in its effect."

"Good, but not good enough," said the eldest of the party, Professor B. Free, revolving his glass so as to make the ice tinkle pleasantly. "Of course you must have responsibility in any good organization. In 1918 when I wore a uniform myself, perhaps that was enough. We turned out men trained to march round and round in the mud and then hurled them in machine-like masses at the enemy. Discipline was the main factor then. This war is different. It is complex and technical and changing; and so is modern public health. Within rather broad limits of discipline, I think you'll own, Colonel, that you want men of individual initiative—men trained to think for themselves, to meet emergencies, to change and grow. Too much routine kills that initiative. Your bureau chiefs, or whatever you call 'em, Doctor, must be stimulated to a maximum of self-development, if you're a really good administrator."

"Right you are," said Dr. Dinator. "But the problem is not quite so simple. I want a disciplined group of free-wheeling bureau chiefs. But I want more than that. They must work as a team for a common end. I think coöperative planning is fundamental in effective management. Looking ahead, charting the program and goals in advance, is an indication of an expectation of progress. Having a goal implies purposeful endeavor. It counteracts a tendency to let down or coast within the groove of routine. It lays the groundwork for measurement, for the fulfillment of plans. And real planning cannot be confined wholly to those on the top rung of the ladder. The staff should be brought into planning. The nurse in the field, the inspector, the clerk at the desk have ideas. The bird and the worm have different vantage points and experiences. A plan handed down from the top is a foreign plan. A plan in which a staff has participated is their plan. There is inspiration and self propulsion to make one's own plan succeed."

"Naturally a director will have a larger voice in deciding on the main elements of a plan, for his scope and responsibility are greater. But the brick and the mortar and the framework should be drawn from the collective experience of the working team. I have often seen dictated plans founder through lack of understanding of their workability on the firing line. I think a director should dispense with the word 'my' and say 'our.'"

"A staff conference in its true sense means a meeting in which people can confer and express themselves. It is not primarily the place for a director's speech or a harangue. Nothing kills staff initiative so quickly as a director monopolizing the chair and exhibiting an attitude that endorsement of his ideas only is expected, and that discriminating judgment is unwanted. The best service a staff member can render his superior within a conference is a frank statement of his beliefs. How much better is opposition within a closed conference, than open, sabotaging criticism later on the outside. I honor the voice of the man who differs with me in conference. His voice adds strength to the eventual plan decided on. Staff conferences are fundamental in good administration."

"Perhaps we're all right," said the Professor, setting down his empty glass with a regretful sigh, "and if we put the three ideas together we've got something. Responsibility, Room-for-Initiative, Relationship, mixed in proper proportions spell good administration. Good-night, boys. Tomorrow is another day."

#### REFERENCE

1. For an authoritative review of this aspect of administration see *The Elements of Administration*, by L. Urwick, Harper and Bros., 1944.

## Legislating for Local Health Units

At the instance of the Association's Subcommittee on Local Health Units, the Conference of Commissioners on Uniform State Laws has undertaken to draft a model permissive or mandatory health unit law, the text of which will be submitted to and acted upon by its 1946 annual meeting. It will thus be available for the 44 state legislatures that will meet in 1947.

The principles suggested by the committee in the drafting of such legislation are:

1. Every part of the state should be provided with adequate and efficient local health service through the organization of county and district departments of health.
2. Existing local health boards should be abolished and their powers and duties transferred to the new county or district organization.
3. The new local health organization should serve a population large enough to support an adequate staff and conduct a complete program of work. Certain conditions should be met:
  - a. The health district should correspond to

- some existing unit or combination of existing units; existing tax, appropriating, and auditing machinery must be utilized.
- b. The local governmental units making up the districts must contribute substantially to its support and have a substantial part in its control.
- c. The maintenance of a specified standard of service must be required for every unit and the state must contribute state aid to make this possible.
- d. Districts may be formed or dissolved or their boundaries changed by the state health board on the recommendation of the state health officer, but local interests should be given a hearing on proposed changes, or may themselves propose changes.
- e. Health officers and all other local unit employees should be under the merit system.
- f. The local health officer should be a physician, should serve full time, be trained in public health, and his appointment approved by the state board of health.
- g. The local health officer should be responsible for his own program, budget expenditures, and personnel under the general supervision of the state health authority.

# Meat and Meat Products and Cereal Products\*

## *Food and Nutrition Section*

THE methods herein described are offered for consideration as tentative methods for the examination of certain products. It is realized that they are far from being complete and adequate for all types of work, but it is hoped that from time to time they will be supplemented with other methods, and refinements made of the ones here submitted. Any aid along this line will be greatly appreciated.

### Tentative Methods for the Examination of Meat and Meat Products

In this report, for the sake of ease in handling, meat is divided into six rather broad types. Methods of handling, sampling, and examination are made on that basis, while the bacteriological media employed have been combined under one head in order that reference may be made to a specific medium without repetition.

the bacterial flora of "bottled" samples when stored, even at temperatures as low as 45° to 50° F., the samples must be examined as promptly as possible after collection.

It is usually advisable to ship samples in special shipping containers refrigerated with dry ice rather than natural ice.

#### GENERAL CONSIDERATIONS IN COLLECTING AND HANDLING OF SAMPLES

##### COLLECTION

Sample bottles, prior to use, shall be cleansed with great care, rinsed in clear water, dried and sterilized. Great care must be exercised to have the samples taken represent the meat items to be tested, and to see that no contamination or change occurs prior to the examination.

##### STORAGE AND TRANSPORTATION OF SAMPLES

Because of the rapid and often extensive changes which may take place in

##### PREPARATION OF THE SAMPLE

The samples taken should be truly representative of the meat to be examined and should consist of several portions taken from different locations. The samples should be ground by passing through a food grinder to divide the product into fine particles in order that the bacteria located in all portions may be placed in solution. The samples, after placing in dilution bottles, should be shaken thoroughly to disperse evenly the meat and give a uniform suspension.

Shaking machines and grinding machines are very helpful in obtaining

\* Report of the Committee on Microbiological Examination of Foods.  
COMMITTEE ON MICROBIOLOGICAL EXAMINATION OF FOODS.

Organized 1932. Published reports: *Year Books*. 1935-1936, 1937-1938, 1941-1942, *A J.P.H.*, June, 1943.

uniformity of results. Sterile broken glass and other agents are very helpful in obtaining uniform suspension for plating.

1. Fresh Uncured Meats (beef, pork, lamb, veal, hamburger, etc.)—

Ten to twenty small portions of meat are taken aseptically from the meat to be examined and placed in a sterile wide mouth sample bottle. The sample should weigh at least 50–75 gm.

Grind in sterile small meat grinder, and weigh 10 or 11 gm. of ground meat into dilution water (10 gm. if 90 ml. water blank and 11 gm. if 99 ml. water blank is used). The first dilution bottle is shaken 3 minutes in a standard shaking machine or 100 shakes by hand, and then the desired dilutions made in the ordinary manner.

For total bacterial count, plate with nutrient agar<sup>1</sup> and incubate 72 hours at 20° C. North gelatin agar<sup>7</sup> plates may also be used. For the enumeration of specific types of bacteria differential media may be used. The 20° C. incubator temperature is used, since fresh meat is kept under refrigeration and best results will be obtained if the lower temperature of incubation is used.

2. Hams—

a. Ready to eat, boiled, delicatessen, etc.

Take samples from the outside flesh portion of the hame after removing about ½ in. of the outside meat, and from areas around the articulations of the tibia and femur.

Prepare sample as described above under Fresh Meat.

For total bacterial count, use nutrient agar<sup>1</sup> or North gelatin agar<sup>7</sup> plates. Incubate for 48 hours at 37° C. and count the total number of bacteria and note numbers of *Staphylococcus aureus*.

For total *Staphylococcus* count, use blood agar<sup>3</sup> plates.

Incubate for 48 hours at 37° C.

For poor binding in boiled hams, use nutrient gelatin<sup>2</sup> plates and count the gelase producers after three days' incubation at 20° C.

For green discoloration of hams use blood agar,<sup>3</sup> benzidine blood agar,<sup>6</sup> or North gelatin agar<sup>7</sup> plates.

Incubate for 2–4 days at 37° C. and count the oxidizing bacteria. Use Cystine broth,<sup>4</sup> incubated 2–4 days at 37° C. to indicate sulfide-forming bacteria.

b. Sweet Pickle Smoked Hams

The most important defect to determine in smoked hams is ham souring. The points of souring may be divided into six general areas:

- a. "Shank Sour" or sour tibial marrows
- b. "Body Sour" or sour meat
- c. "Aitch Bone Sour" or souring of the os pubis remaining in the ham
- d. "Stifle Joint Sour" or souring of area around articulation of femur and tibia-fibula
- e. "Body Bone Sour" or sour femur marrow
- f. "Butt Sour" or sour in butt between aitch bone and muscle.

In order to locate source of trouble, samples should be taken in these areas.

For aerobic bacteria causing ham souring, use North gelatin agar.<sup>7</sup> Emulsify bone marrow, tissues, pickle, etc., in the agar while held at water bath temperature of 42° C. Incubate plates at 20° C. and 37° C. and look for members of the genera: *Achromobacter*, *Bacillus*, *Pseudomonas*, *Proteus*, *Serratia*, and *Micrococcus*.

For anaerobic bacteria causing ham souring, use meat and samples of pickle, marrow, tissue, scrapings, etc., as indicated. Heat sample to 80° C. for 20 minutes so that only viable spores remain. Use glucose-brain-broth<sup>5</sup> and peptone colloid medium (Difco special formula), and incubate for 2 days at 20° C. and 37° C. Look for *Clostridium putrefaciens* and other clostridia.

### 3. Bacon

Grind sample as indicated under Fresh Meat.

For total bacterial count use nutrient agar<sup>1</sup> or North gelatin agar<sup>7</sup> plates incubated for 48 hours at 20° C. Count the colonies and then flood the plate with a 0.4 per cent aqueous solution of tetramethylparaphenylenediamine-hydrochloride (Eastman) so that colonies are just covered with the solution, and observe until no more colonies take on a purple color. Count the purple colonies and record as "oxidizers."

For H<sub>2</sub>S forming bacteria, pour blood agar<sup>3</sup> plates and incubate for 2 days at 37° C. in 5 per cent CO<sub>2</sub> or H<sub>2</sub> or under partial vacuum in a standard anaerobic jar. The plates should be poured one-half to two-thirds full. Count the embedded green colonies and record as H<sub>2</sub>S forming bacteria. Bismuth sulfite agar (Difco formula) may be used as a plating medium and incubated for 2 days at 37° C. The black colonies are sulfide formers.

For gum formation in bacon during curing, use Nutrient agar<sup>1</sup> or North gelatin<sup>7</sup> agar plates, to which 1 per cent sucrose, 0.05 per cent sodium citrate, 0.075 per cent sodium nitrate and 0.1 per cent glycerol have been added. Incubate for 7 days at 20° C.

If only the presence or absence of H<sub>2</sub>S forming bacteria is desired, use cysteine broth<sup>4</sup> tubes and incubate 2 days at 37° C.

### 4. Sausage

In sampling, five or six frankfurters or a 4 to 5 in. section of bologna, meat loaf, etc., should be taken as representative samples. The sample should be taken aseptically from the inside meat. In preparing the sample, consideration should be given to the nature and consistency of the samples. Bologna, meat loaves, etc., resist disintegration during shaking and consequently it is

necessary to grind or cut into very small pieces in order to obtain a representative analysis. If sample does not break up rapidly, it should be shaken more than the standard 100 shakes by hand. The amount of shaking can best be judged by the thoroughness of the dispersion in the water blank. The same type of sample should always be given the same kind of treatment in order to obtain comparable results.

For total bacterial count, employ Nutrient agar<sup>1</sup> or North gelatin agar.<sup>7</sup> Incubate for 2 days at 37° C.

### 5. Jellyed Meat Products

The sample is obtained and prepared as under other types of meat. The weighed sample or the first water blank should be warmed to melt the gelatin and obtain good dispersion.

For total bacterial count, use Nutrient agar.<sup>1</sup> Incubate for 2 days at 37° C., and in addition to the total count, observe the number of Staphylococcus colonies.

### 6. Dehydrated Meat

Sample should be treated the same as for other meat products. The dried meat sample should be weighed into the water blank and shaken thoroughly. It will rehydrate quickly. If very fat, the blank may be warmed slightly in order to obtain better dispersion. Make total bacterial count using Nutrient agar.<sup>1</sup> Incubate 2 days at 37° C.

#### MEDIA TO BE USED

##### 1. Nutrient Agar—

Prepared and used according to A.P.H.A. *Standard Methods*.

##### 2. Nutrient Gelatin—

Prepared and used according to A.P.H.A. *Standard Methods*.

##### 3. Blood Agar—

Blood agar base Nutrient agar base may be used for blood agar. Obtain

whole-blood aseptically from sheep, and defibrinate with glass beads as it is drawn from the jugular vein. The defibrinated blood is tubed aseptically in sterile culture tubes for storage at refrigeration temperatures. The melted agar base is cooled to 45° C. and the whole sterile sheep's blood added in 10 per cent amounts. If chocolate agar is desired (for differentiating H<sub>2</sub>S forming bacteria from oxidizing bacteria), add 5 per cent whole sterile sheep's blood to the agar base held at 90° C. Mix thoroughly, avoiding the formation of bubbles, and pour into plates if streaks are to be made. If pour plates are desired, cool to 45° C. and pour in thin layers. This is necessary since the medium is opaque, and, if thin, most colonies can be counted. Green colonies indicate peroxide producing bacteria, while sulfide producers do not react.

#### 4. Cystine Broth—

To nutrient broth add 0.1 per cent of 1-cystine and tube one-quarter full in ordinary culture tubes. Sterilize at 15 lbs. for 15 minutes.

Cut strips of filter paper and saturate one end of each strip in saturated lead sub-acetate solution to which a little glycerol has been added.

After inoculating the cystine broth in regular serial dilutions, insert the lead sub-acetate paper into the tube in such a way that it is held in place above the solution by the cotton plug. It must not come in contact with the

liquid. Incubate at 37° C. for 24–48 hours. The blackening of the paper indicates hydrogen sulfide production.

#### 5. Glucose-Brain-Broth—

Add 5–10 gm. of fresh sheep brains (gray matter only) to large culture tubes (1 x 8 in.).

Cover the tissue with about 30 ml. of glucose broth and sterilize for 25 minutes at 15 lb. pressure.

The glucose broth is made as follows:

Peptone .....	10 gm.
Beef extract .....	5 "
NaCl .....	5 "
Glucose .....	5 "
Water .....	1,000 ml.

#### 6. Benzidine Blood Agar—

Add to regular blood agar 10 per cent of a 0.5 per cent solution of benzidine in 85 per cent sodium chloride. The purest grade of benzidine is necessary in order not to darken the blood.

#### 7. North Gelatin Agar—

This is a Difco modification of North's medium. It consists in dehydrated form of:

Infusion from veal .....	500 gm.
Proteose-Peptone .....	20 "
Gelatin .....	20 "
Soluble starch .....	10 "
Isoelectric Casein .....	2 "
Sodium Chloride .....	5 "
Agar .....	15 "

Seventy-seven gm. of this mixture is suspended in 1,000 ml. of distilled water, adjusted to pH 7.3 and autoclaved 20 minutes at 15 lb. pressure.

## Tentative Methods for the Examination of Cereal Products

The term, cereal products, covers a wide field for it may be considered to include all cereal products from the unmilled grain to any manufactured products in which cereal products are significant ingredients. However, in

this report the term is restricted to its more common usage, that of food products consisting essentially or wholly of materials obtained from milled grain. Even this list is long and calls for a variety of bacteriological pro-

cedures which this preliminary report makes no pretense of adequately covering.

In addition to the usual bacterial counts of cereal products it is also frequently desirable to determine the numbers of specific types of organisms present as Tanner<sup>1</sup> has emphasized. For example, it is important for a canner to know whether spoilage organisms are present in the cereal products he uses, and if so the types present. In the baking and milling fields, for example, Amos and Kent-Jones<sup>2</sup> and Hoffman, *et al.*<sup>3</sup> have shown the significance of rope-producing bacteria. As Tanner<sup>1</sup> has pointed out, public health officials may be concerned at times as to whether pathogenic or food poisoning bacteria may be present in cereal products.

#### PREPARATION OF SAMPLE

Since most cereal products are insoluble in water the preparation of suitable dilutions for inoculating Petri plates offers a problem. Generally speaking in order to obtain uniform and accurate results it is necessary to use comparatively large samples and to have them in a rather finely divided state, e.g., like flour or meal. In dry or solid materials, such as cereal products, distribution of the bacterial population is frequently not uniform, hence the necessity of testing comparatively large amounts to obtain fairly representative samples.

The smaller the particle size of the material the greater the chance of bacteria will be exposed and washed off into the dilution water. This process is aided by the abrasive action of sand, glass beads, etc., incorporated in the dilution blank.

If the sample is in the form of a flour it may be used without treatment. If the sample is coarse the particle size of the representative sample should be reduced to approximately that of a coarse

meal by grinding, with aseptic precautions, in a sterile mortar and pestle.

#### BACTERIOLOGICAL METHODS

##### 1. Total plate count—

After thoroughly mixing the prepared sample, weigh aseptically a 10 gm. sample in a sterile aluminum boat or on a piece of sterile paper. Transfer the sample to a dilution bottle fitted with a solid stopper and containing 90 ml. sterile water and 10 gm. of purified sterile sea sand. (The type of bottle and stopper recommended are those specified by "Standard Methods"<sup>4</sup> which also illustrates a suitable weighing boat.<sup>5</sup> Shake vigorously for at least one minute. Allow to stand for two or three minutes until most of the solids have settled to the bottom.

From the supernatant fluid of this primary dilution inoculate the 1:10 plates and prepare serial dilutions in multiples of ten in the usual manner. Plates are inoculated from each dilution. Pour the plates using Tryptone Glucose Extract Agar, of the following formula (dehydrated agar may be used), and observe the general precautions given for the pouring of plates in Standard Methods<sup>4</sup>:

Bacto-Tryptone .....	5 gm.
Bacto-Dextrose .....	- 1 "
Bacto-Beef Extract .....	3 "
Bacto-Agar .....	15 "
Distilled water .....	1,000 ml.
Final pH 7.0	

Incubate the plates at 35–37° C. for 48 hours and count the colonies. Report the results as the bacterial plate count per gm.

##### 2. Thermophilic Count—

This count is made in the same manner as for total plate count except that the plates are incubated at 55° C. for 48 hours. It is desirable to determine the 37° C. and 55° C. plate counts of a sample at the same time as thereby some indication is obtained



whether the thermophiles are obligate or facultative. Report as thermophilic plate count per gm. of cereal product.

Another method for making thermophilic counts is by use of the Reeves Medium.

#### PREPARATION OF REEVES MEDIUM

1. Make a broth according to the following formula:

Peptone .....	10 gm.
Beef extract .....	5 "
Dextrose .....	5 "
NaCl .....	5 "
Distilled water .....	1,000 ml.

Warm the water to dissolve the ingredients and adjust to a pH of 7.0-7.4 with N/1 NaOH approximately 3 ml. per liter will make the adjustment.

2. Prepare the following and grind in food chopper obtaining a fairly uniform mixture:

Lung tissue .....	40 gm.
Spleen .....	7 "
Heart muscle .....	20 "
Brain (sheep or .....	10 "
calf gray matter) .....	20 "
Soy grits .....	3 "

To each 100 gm. of this mixture add approximately 50 ml. of the above broth and mix thoroughly to make a slurry. Tube this mixture in 1x8 in. test tubes (preferably screw cap) to a depth of about 2 in., using a wide stem funnel or by the use of a large pipette. The above broth is then added to an additional depth of 3 in. Into this test tube is placed a small inverted test tube supported on an aluminum wire of sufficient length to maintain the bottom of the tube above the level of the meat but well below the top of the liquid level. This is to prevent the mouth of the gas tube from becoming plugged and allows gas formation to be recorded. Screw caps or very tight plugs are necessary to prevent excessive evaporation upon incubation. Autoclave at 15 lb. pressure for 45 minutes to insure sterility.

#### USE OF REEVES MEDIUM

Weigh sample aseptically into sterile 99 ml. water blank and make serial dilutions in the ordinary manner. From each of the serial dilutions make inoculations into the tubes of Reeves medium which have previously been warmed in a water bath at 55° C.

Incubate at 55° C. for 4 days. Note the formation of gas in the small tube in each dilution and report as gas-forming thermophiles per gm. If there is no gas determine

non-gas-forming thermophiles by making a slide from the supernatant liquid of each dilution, stain and observe types of bacteria under the microscope. This is necessary since turbidity cannot always be relied upon in determining growth.

#### 3. Thermophilic Anaerobes Producing $H_2S$ —

Test for these organisms by the method outlined by the National Canner Association.<sup>7</sup>

#### 4. Mold Count—

This count is made in the same manner as the 37° C. plate count except that plates are poured with Malt Agar, pH 5.5 (dehydrated agar is recommended) and the plates are incubated at room temperature (25° C.) for 4 days. Count the mold colonies developing on the plates and report as the mold plate count per gm. of product.

An alternate medium is Potato Dextrose agar as given in *Standard Methods for the Examination of Dairy Products*, 8th ed. 1941, page 112.

#### 5. Method of Counting "Rope" Spores in Cereal Products—

This method is essentially that of Amos and Kent-Jones.<sup>2</sup>

Two different dilution blanks are used; 400 ml. of 0.5 per cent NaCl, containing 20 gm. of clean sea sand, in a rubber stoppered 16 oz. bottle, and 100 ml. of 0.5 per cent NaCl in a rubber stoppered dilution bottle. Sterilize by autoclaving for 30 minutes at 20 lb. pressure.

The test medium is made by dissolving 10 gm. Bacto peptone, 5.4 gm. Bacto beef extract and 9 gm. sodium chloride in 1 liter of distilled water and adjusting the pH to 7.2-7.3. This broth is distributed in 5 ml. amount in test tubes 5/8 in. diameter, plugged with cotton and sterilized by autoclaving for 30 minutes at 20 lb. pressure (126° C.).

Weight 20 gm. of cereal aseptically

and transfer it to the 16 oz. dilution blank and shake vigorously for 2 minutes. This constitutes the primary suspension.

From the primary suspension inoculate 1 ml. and 2 ml. amounts respectively into tubes of the test medium. Then, after reshaking, transfer aseptically 20 ml. of the primary suspension to the 100 ml. dilution blank and shake this bottle vigorously.

From this second dilution inoculate aseptically tubes of the test medium with 4, 3, 2.5, 2, 1.7, 1.5, 1.3, 1.2, and 1 ml. amounts respectively. The bottle is shaken once or twice before the withdrawal of each of the above quantities.

Each tube is taken individually, the contents thoroughly mixed, and the tube *at once* placed in a bath of boiling water so that the level of the water is above the level of the liquid in the tubes. An Arnold steamer may be used instead of the water bath, provided it does not wet the cotton plugs of the tubes. The tubes are kept in the boiling water, or flowing steam in the Arnold, for 20 minutes. On removal of the tubes from the bath, or the steamer, their contents are thoroughly mixed and they are then incubated at 37° C.

The contents of the tubes are well mixed three or four times during the first 24 hours of incubation. At the end of 48 hours' incubation the tube in which a pellicle has grown on the surface of the broth is recorded as positive. The number of rope spores per gm. is taken as the reciprocal of the smallest fraction of a gram of flour giving a positive result.

If, as sometimes happens, a negative result is obtained with a quantity of flour greater than the smallest amount giving a positive result, then the number of spores per gm. is taken as the reciprocal of the quantity next greater than the smallest amount giving a positive result.

The quantity of cereal corresponding to the various inocula used are:

2	ml.	primary susp.	=	1/10	gram cereal
1	ml.	"	"	=	1/20 " "
4	ml.	20:100 dil.	=	1/30	" "
3	ml.	"	"	=	1/40 " "
2.5	ml.	"	"	=	1/48 " "
2	ml.	"	"	=	1/60 " "
1.7	ml.	"	"	=	1/70 " "
1.5	ml.	"	"	=	1/80 " "
1.3	ml.	"	"	=	1/92 " "
1.2	ml.	"	"	=	1/100 " "
1	ml.	"	"	=	1/120 " "

If the cereal contains more than 120 spores per gm. higher dilutions are prepared and the corresponding inoculations made.

Amos and Kent-Jones<sup>2</sup> emphasize several precautions. One is the heat resistance of the spores. In this connection it is well to sterilize, by autoclaving, the tubes of inoculated test medium and the dilution blanks after they are used and before they are washed to prevent spreading these spores.

Another is the possible confusion between "rope" and other organisms. *Bacillus subtilis* is an organism which sometimes occurs in cereal and, if present, will form a pellicle on the broth. Since experiments have shown that this organism does not turn bread rosy, it may be advisable, when the spore count is high, to determine whether the pellicles are due to this organism and not to those of the *mesentericus* group. A quick way of doing this is to prepare agar slant cultures from the pellicles; the form of resulting growth will indicate which bacteria are present. *Bacillus mesentericus vulgaris* forms a greyish-white growth which is at first moist and "blister"-like in appearance, but later becomes drier and finely wrinkled. *B. subtilis* gives a whitish, spreading growth, the edges of which, viewed under a low power, appear as an interwoven mass of fine hairs.<sup>2</sup>

Those authors<sup>2</sup> consider it advisable

always to prepare duplicate sets of tubes. Often the two sets do not yield the same figure but they consider that the results obtained are satisfactorily consistent.

#### 6. Gas Forming Bacilli—

If cereal products are to be used in processed foods containing nitrates, such as bologna, meat loaf, certain canned meats, etc., they should be tested for gas-forming bacilli.

In making this test use Jensen's Pork-Sucrose-Nitrate Medium.<sup>6</sup> In making the inoculations from the serial dilutions use 1 ml. pipettes and introduce the inoculum at the bottom of the medium in the tube being careful not to introduce or to allow entrapped air bubbles to remain in the medium. Incubate at 37° C. for 2 days. Gas production should start in 24 hours. If incubated at 49° C. more rapid gas-formation will be obtained.

#### 7. Detection of Flat Sour Spores—

Test cereal products for the presence of flat sour microorganisms by the National Canners Association method.<sup>7</sup>

#### REFERENCES

1. Tanner, F. W. *Microbiology of Foods* (2nd ed.). Garrard Press, Champaign, Ill., 1944, pp. 693-722.
2. Amos, A. J., and Kent Jones, D. W. The "Rope" Spore Content of Flour and Its Significance. *Analyst*, 56:572-586, 1931.
3. Hoffman, et al. *Indust. & Eng. Chem.*, 29: 464-467, 1937.
4. *Standard Methods for Examination of Dairy Products* (8th ed.). American Public Health Assn., New York, 1941, pp. 18-19.
5. *Idem.*, p. 170.
6. Report of Committee on Standard Methods for Microbiological Examination of Foods. "Microbiological Examination of Spices, Fermented Foods and Fruit Juices." *A.J.P.H.*, 33, 6:726 (June), 1943.
7. *Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists*, 5th ed., 1940, p. 642.

HARRY E. GORESLINE, PH.D., *Chairman*,  
Office of Marketing Service, Chicago 3,  
Ill.

M. THOMAS BARTRAM, PH.D.

JAMES A. BERRY

EDWIN J. CAMERON, PH.D.

JOHN L. ETCHHELLS, PH.D.

JAMES E. FULLER, PH.D.

MATTHEW E. HIGHLANDS

LLOYD B. JENSEN, PH.D.

CARL S. PEDERSON, PH.D.

PAUL S. PRICKETT, PH.D.

JOHN M. SHARP, PH.D.

EVAN WHEATON, PH.D.

OSCAR B. WILLIAMS, PH.D.

## Bureau of Medical Services in Maryland

The Maryland State Board of Health has been authorized to create a Bureau of Medical Services under the provisions of a law which became effective June 1. The bureau will administer a program furnishing medical care for indigent and medically indigent persons and will conduct and operate

the chronic disease hospitals to be constructed in the post-war period. A Chief of the Bureau will be nominated under the merit system by the Director of Health. A Council of Medical Care will be established by the State Board to assist in formulating policies connected with the medical care program.

# Examination of Frozen Desserts and Ingredients\*

*Laboratory and Food and Nutrition Sections*

THE work of the committee during 1943-1944 can be summarized briefly because the activities were curtailed under wartime conditions. A well attended two day joint meeting of the committee with the Standard Methods Committee on Milk and Milk Products was held in New York on May 5 and 6, 1944. A manuscript revision of the text of the 8th Edition of *Standard Methods for the Examination of Dairy Products* that had been prepared by Dr. A. H. Robertson was discussed at that meeting preliminary to the preparation of the 9th Edition of that report. The purpose of a revision of the entire text prepared by one individual was the elimination of inconsistencies between directions as written by different referees, but care was taken not to change the directions themselves.

Some very worth while suggested changes in the manner of presenting the material on frozen desserts in the 9th Edition of *Standard Methods* were proposed by the joint committee and an improved reference system was suggested. Rearrangements of the text will provide for convenience of users of the volume by placing related methods together regardless of whether they are used in the examination of frozen desserts or other dairy products. An example is a proposed section of the book to include all sediment testing

methods. A subcommittee of the referees concerned is attempting to develop greater uniformity for sediment testing procedures. Likewise, it was voted to organize a separate section in the forthcoming volume devoted entirely to "screening" methods. While screening methods serve as "Rapid Survey Procedures," they do not have unqualified approval for indiscriminate use. Work was undertaken to secure uniformity of directions in the forthcoming edition with the next edition of *Standard Methods for the Examination of Water and Sewage*. It was brought out that extensive work is known to be in progress on the examination of eggs that should be given consideration by the committee, and also that the present volume lacks a method for the examination of stabilizers. The Referee for the Bacteriological Examination of Ingredients of Frozen Desserts was requested by the joint committee to expand the sections on methods for examining eggs and gelatin so that the latest forms of these methods will be available for the new edition.

Milton E. Parker, a member of the committee, appointed from the Food and Nutrition Section, has very recently found it necessary to resign from the committee. He has served on the committee for several years and, with the assistance of the Associate Referees working under him, prepared the section

---

\* Report of the Joint Standard Methods Committee.

STANDARD METHODS COMMITTEE ON FROZEN DESSERTS AND INGREDIENTS

Organized 1937. Published reports: *Year Books* 1937-1938, 1938-1939, 1939-1940, 1940-1941, 1941-1942, *A.J.P.H.*, May, 1943.

on Sediment Testing of Frozen Desserts and Ingredients Used in Frozen Desserts, that appeared in the 8th Edition of the Standard Methods report. Mr. Parker's resignation is accepted with regret.

It is suggested that the committee be continued as work is in progress on the revision of the methods for analyzing frozen desserts to be published in the 9th Edition of *Standard Methods for the Examination of Dairy Products*.

FRIEND LEE MICKLE, Sc.D.,  
Chairman, Joint Committee,  
State Department of Health,  
Hartford, Conn.

*Representatives from the Laboratory  
Section*

FRIEND LEE MICKLE, Sc.D.,  
Chairman  
JAMES A. GIBBARD  
A. H. ROBERTSON, Ph.D.

*Representatives from the Food and  
Nutrition Section*

F. W. FABIAN, Ph.D., Chairman  
M. E. PARKER  
J. H. SHRADER, Ph.D.

*Associate Referees*

M. T. BARTRAM, Ph.D.  
PAUL A. DOWNS, Ph.D.  
H. H. HALL  
F. LESLIE HART  
P. S. LUCAS  
W. H. MARTIN  
PAUL S. PRICKETT, Ph.D.  
B. E. PROCTOR, Ph.D.  
M. J. PRUCHA, Ph.D.  
E. C. THOMPSON, Ph.D.  
P. H. TRACY, Ph.D.

## Patients on Hospital Ships Now Get Whole Milk

A new method of quick-freezing whole milk is now making it possible to serve wounded soldiers returning from overseas on Army hospital ships with glasses of the beverage as appetizing and as tasty as any to be had on the farms of America.

Although in some instances the milk has been kept in the frozen state for three months, its taste is as fresh as if it had just come from the cow and the bacterial count is lower than that in the milk supply of the average American home. This important addition to the diets on the hospital ships resulted from a series of

researches carried out by the Veterinary Division of the Office of the Surgeon General.

Brigadier General R. A. Kelser, Director of the Division, said that his research workers soon found that if milk were frozen slowly there was a tendency for the fat to be thrown out of emulsion and precipitated so that the milk was broken down into its constituent parts and proved unsatisfactory when thawed out. However, if the milk were frozen with extreme rapidity, it froze in very tiny crystals. As a result, when thawed out, it was found to be in its original condition.

# Examination of Germicides and Antibacterial Agents\*

## Laboratory Section

THE Report of the Standard Methods Committee for the Examination of Germicides and Antibacterial Agents comprises separate progress

reports from the several Referees and Associate Referees.

STUART MUDD, M.D., *Chairman*, University of Pennsylvania, Philadelphia

## Chemical Antiseptics

In the preliminary work on the development of methods for testing antiseptics during the past year, two of the Associate Referees, G. G. Slocum and W. A. Randall, have studied a group of media to determine their efficacy in the *in vitro* testing of antiseptics. Through the courtesy of one of the peptone manufacturers we were supplied with nine batches of peptone, all of which, from the standpoint of the manufacturer, were as nearly identical as it was possible to produce. These peptones have been carefully studied to determine whether, when used in a test medium, they were capable of maintaining the resistance of *Staphylococcus aureus*, and also whether there was any variation from one peptone to another. Similar studies have been made by the Referee and Associate Referees on chemical disinfectants. The results of the studies indicate definitely that there was a marked difference in the ability of these peptones to maintain the resistance of *S. aureus*, and that there was definite variation from one peptone to another. Work is now under way in which tests are being made of

peptones produced by the digestion of casein. Preliminary studies appear to indicate that such peptones may help in a solution of the problem concerning the development of a medium which is uniform and reproducible.

A preliminary method has been developed to determine the efficacy of germicides in the destruction of spores related to those preparations offered for use for cold sterilization of surgical instruments. One of the Associate Referees, Dr. J. D. Brewer, has devised a hinged joint which is similar to the joint in scissors. It has a closure of a few thousandths of an inch and probably represents the most difficult of all surgical instruments to sterilize. The technique of test would be, in general, to contaminate this hinged joint with spores in whole blood by allowing the blood suspension of spores to flow into the joint by capillary action and coagulate. After subsection of the joint to the chemical agent under test it would then be transferred to a tube of testing medium such as thioglycollate medium. The scissor joint has attached to it a circular loop to facilitate handling. These surgical joints can be made to hold to a tolerance of a few thousandths

\* Committee authorized 1941. Published Reports, *A.J.P.H.*, May, 1943, and Aug., 1944.

of an inch and seem to represent a reasonably accurate reproduction of the joints of instruments which are not completely accessible to scrubbing with a brush before immersion in a "sterilizing" fluid.

The referees involved in the investigations dealing with antiseptics and disinfectants have worked closely together during the past year and because of their common interests will continue to do so.

HENRY WELCH, PH.D., *Referee*

## Chemical Disinfectants

Unprecedented advance in the development of germicides has taken place in recent years. The standardized methods which were dependable for evaluating coal-tar, cresylic and pine oil types of disinfectants are not adequate as measures of proficiency for the variety of chemical germicides in current use.

It was pointed out in last year's report on this subject that one of the principal difficulties interfering with the adaptation of standardized testing methods lies in the exaggerated effect that slight differences in the test culture may have in the testing of certain types of the newer compounds. One of the primary causes of variations in test cultures is the culture medium. During the year the subcommittee compared the phenol coefficient results on five widely different chemical compounds obtained by using the regulatory F.D.A. medium and a promising brand of dehydrated medium developed specifically for disinfectant testing. The study was significant for the wide variation of results obtained by the qualified and experienced operators. As might be expected, the most uniform figures were obtained with a fortified coal-tar preparation and sodium ortho phenyl phenate while the most diverse resulted from the tests on a halogenated synthetic phenol. One operator obtained widely different phenol coefficient figures by culturing the test organisms in media made from different batches of regulation peptone. This collabora-

tive effort emphasized the need for a consistent and uniform culture medium for use in testing germicides. However, production lots of peptone are likely to vary in their nutritive properties; and in fact, collaborative work in the Antiseptic and Disinfectant Subcommittees together with the kind coöperation of one of the leading culture media producers demonstrated the difficulty of reproducing this material exactly.

Solution of this problem consequently lies in the use of a synthetic or semi-synthetic medium or in an available stock pile of composite batches of peptone sufficiently large to supply germicidal testing laboratories over a substantial period. One of the collaborators of this committee, Dr. D. A. Wolf, has succeeded in producing a semi-synthetic medium of considerable promise for the production of test cultures. Also experimental evidence has been accumulated within the committee that a tryptic digest of casein, supplied by Sheffield Farms, a subsidiary of National Dairies, under the name of N-Z Case, is a satisfactory and consistent medium for the production of test cultures of both *Eberthella typhosa* and *Staphylococcus aureus*. This constituent produces a satisfactory culture medium without the use of beef extract, thereby eliminating an additional source of variation. It is understood that this product can be produced in sufficiently large quantity to allow a satisfactory and uniform composite stock supply.

Neither of these two media has been subjected to collaborative study by the committee, although the casein digest has been found by one of the committee members to equal the best available peptone as an ingredient for satisfactory subculture medium.

It has become increasingly apparent and is now well recognized that no single laboratory test of the coefficient-drop type can supply adequate information concerning the proficiency of a germicide in practical use. On the

other hand, the need for reliable means of comparing potential germicidal quality is urgent. Present activities of this and closely related committees are being devoted toward refining and modifying available methods with this end in view. Sources of variation in a biological test may be intricate, and must be eliminated one by one, consequently spectacular progress in revising and developing a standardized reference test for germicides should not be expected.

CHARLES M. BREWER, *Referee*

## Antibiotic Agents

The great potentialities of penicillin for combating a number of infections caused by Gram-positive bacteria and a variety of other diseases, notably gonorrhea and syphilis, led to tremendous interest in the production and utilization of this antibiotic substance, that by far overshadowed the interest in all the others combined. The great advantages of penicillin as a chemotherapeutic agent comprise its activity against aerobic and anaerobic Gram-positive bacteria; its relatively low toxicity to animals; the inability of blood, pus, and other body fluids to prevent its antibacterial action; its activity upon sulfonamide-resistant strains of bacteria. However, penicillin also has certain limitations, chief of which are, its relative instability against chemical and biological agents, the adaptation or increasing resistance of sensitive bacterial strains to its potency, and its limited activity against Gram-negative bacteria, fungi, and other disease-producing agents.

The investigations carried out thus far on penicillin can be divided into several categories:

1. Isolation and selection of more active penicillin-producing strains of *Penicillium notatum* and *Penicillium chrysogenum* from

different substrates, to replace the less potent strains now in use; several new strains were thus obtained; the yields of penicillin obtained from each strain were found to vary depending on the nature of the substrate and the conditions of culture, such as surface growth vs. submerged and agitated growth.

2. Studies of the nutrient requirements and conditions of culture favorable to the production of penicillin; whereas at first the stationary method was most prevalent, gradually the growth of the penicillin-producing strains in deep tanks in a submerged and agitated state began to replace the stationary procedure; certain other methods, such as the use of bran as a medium, the trickling filter, the use of soft agar, as well as the surface liquid culture, are still in use for the growth of the organism and the production of penicillin.

3. Methods of assaying penicillin, comprising the dilution, cup and turbidimetric methods, and a variety of other less common procedures such as effect of penicillin upon the production by suitable bacteria of hemolysin, nitrite and other metabolic products.

4. Production of penicillin by various other fungi, in addition to above two groups.

5. Studies of the chemical and physical properties of penicillin.

6. Utilization of penicillin for disease control.

7. Mode of action of penicillin upon bacteria *in vitro* and *in vivo*.

In addition to penicillin, other antibiotic agents received considerable at-



tention. It is sufficient to mention streptothricin and streptomycin, substances active upon both Gram-positive and gram-negative bacteria, in contradistinction to gramicidin and penicillin that are largely active against Gram-positive bacteria. The production by bacteria of antibiotic agents, aside from tyrothricin, has also received attention. Various fungi were found to produce more than one antibiotic substance. This is true of *Aspergillus flavus* (aspergillilic acid and penicillin), *A. fumigatus* (spinulosin, fumigatin, fumigacin, gliotoxin), and others. Some of the antibiotic agents are produced by a large number of different organisms. Fumi-

gacin, when freed from a small amount of accompanying gliotoxin, was found to be identical with helvolic acid. Clavacin, also designated as claviformin, patulin and clavatin, depending on the organism producing it, is a good illustration; it has now been crystallized and its chemical nature determined. It is active against both Gram-positive and Gram-negative bacteria, and is fairly toxic to animals. Gliotoxin is produced by species of *Trichoderma*, *Gliocladium*, and *A. fumigatus*; it is a highly potent substance and is active both upon fungi and bacteria.

SELMAN A. WAKSMAN,  
Associate Referee

### Disinfection of Air by Germicidal Vapors and Mists

The principal advances in this field during the past year are the development of suitable apparatus for the dispersion of glycol vapors and the construction of a device for the automatic regulation of the concentration of glycol vapor in the air. Two types of glycol vaporizers have been made: one operates on the principle of passing heated air over a number of slowly rotating metal discs which dip into a pool of glycol.<sup>1</sup> The amount of glycol vapor dispersed is controlled by varying the temperature of the evaporating current of air. The other type of glycol vaporizer employs the method of boiling water-glycol mixtures and provides a certain amount of water vapor with the glycol vapor.<sup>2</sup> The rate of glycol evaporation is controlled by varying the ratio of water to glycol which determines the boiling point of the mixture. An automatic device for adding water is employed to maintain the boiling point at the desired temperature.

Automatic regulation of the concentration of glycol vapor in the air has been achieved by means of an instrument designated as a glycostat which

controls the vapor output of the glycol disperser.<sup>3</sup> The apparatus consists, in brief, of a constant beam of light which is reflected from the shiny rim of a slowly rotating metal wheel, to a photoelectric cell whose current controls the vaporizer. This wheel dips into water and is cooled by evaporation caused by an air current directed against the rim. Glycol vapor condenses on this cooled surface in proportion to its concentration in the air. With increasing deposition of glycol on the wheel rim, the intensity of the light reflected to the photocell is progressively diminished until it ceases to activate the relay interposed between the photocell and the vaporizer, and vaporization of glycol ceases. Conversely as the concentration of glycol in the air falls, condensation on the rim, which is constantly cleaned by passage through water, diminishes, with the result that the intensity of the reflected light increases to the point where the relay closes and the vaporizer is set in operation again. Actual test of this glycostat under practical conditions has shown that it is possible to maintain constantly a bac-

tericidal concentration of triethylene glycol vapor in the air below the saturation point, i.e., without the occurrence of a mist.

Since last year's summary of the subject in this section, there have been several reports on the effectiveness of glycol vapors in controlling respiratory disease and air-borne bacteria. Extension of the study carried on in the wards of a children's hospital<sup>4</sup> revealed a continued marked reduction in the incidence of acute respiratory diseases in the glycol treated wards. Observations on the bacterial population of the air in glycol treated and untreated wards have shown a pronounced diminution of air-borne bacteria in the former spaces.<sup>4, 5</sup> A study of the effect of triethylene glycol vapor on a single respiratory pathogen, namely beta hemolytic streptococcus group A which was present in considerable numbers in

the air of wards housing patients suffering from upper respiratory infections due to this agent showed that the glycol produced a reduction of approximately 65 per cent in the number of air-borne streptococci. However, when the vapor was employed in conjunction with oil treatment of bed-clothing and floors the reductions exceeded 90 per cent.<sup>6, 7</sup>

#### REFERENCES

1. Coey, S. C., and Spiselman, J. W. To be published.
2. Jennings, B. H., Bigg, E., and Olson, F. C. W. *Heat. Pip. & Air Cond.*, ASHVE Journal Section, 16:538-545 (Sept.), 1944.
3. Puck, T. T., Wise, H., and Robertson, O. H. *J. Exper. Med.*, 80:377, 1944.
4. Harris, T. N., and Stokes, J. *Am. J. M. Sc.*, 206:631, 1943.
5. Personnel of Navy Medical Research Unit No. 1, *U. S. M. Bull.*, 42:1288, 1944.
6. Hamburger, M., Jr., Puck, T. T., and Robertson, O. H. *J. Infect. Dis.*, 76:208, 1945.
7. Puck, T. T., Hamburger, M., Jr., Robertson, O. H., and Hurst, V. *J. Infect. Dis.*, 76:216, 1945.

O. H. ROBERTSON, M.D.

Associate Referee

### Disinfection of Air by Ultra-violet Irradiation

In an important investigation, Lurie of the Phipps Institute<sup>1</sup> reported on "The Prevention of Natural Air-borne Contagion of Tuberculosis in Rabbits by Ultraviolet Irradiation." This paper establishes the "air-borne route" for the transmission of tuberculosis in rabbits. Striking results in regard to control of tuberculosis by means of ultra-violet were obtained. The practical application of these findings in the prevention of air-borne transmission of tuberculosis in man will have to overcome certain technical difficulties. Not the least is the fact that man can safely be exposed to only very little radiation of 2,537Å.

In a comparative study of the sensitivity of viruses and bacteria to monochromatic ultra-violet radiation it was reported that influenza virus has a maximum of sensitivity at 2,650Å very similar to bacteria, and that

this virus is about twice as resistant as *Escherichia coli* to ultra-violet radiation.<sup>2</sup>

A number of studies on the control of air-borne contagion in day schools are in progress; however, no further publications on the results of these studies have been published.

The difficulty in obtaining reliable epidemiology data on the control of air-borne contagion has been emphasized by a study of the National Institute of Health on the use of ultra-violet upper air irradiation of sleeping quarters in a boys' training school.<sup>3</sup> This study which gave interesting information on other points gave little information on the value of ultra-violet in the control of upper respiratory infection because the incidence of illness during the period of study was very low.

The use of ultra-violet radiation in

the control of air-borne contagion in crowded military sleeping quarters was tested by using upper air as well as floor irradiation in an extensive study at a naval training station.<sup>4</sup> The reduction of upper respiratory infection was about 25 per cent during a season of relatively low incidence of illness. It was brought out in this study that the intensity of ultra-violet radiation is of greatest importance for the control of cross-infection. Such evidence has

also been presented by Lurie<sup>1</sup> in his study on tuberculosis.

#### REFERENCES

1. Lurie, Max B. *J. Exper. Med.*, 79:559-573, 1944.
2. Hollaender, A., and Oliphant, J. W. *J. Bact.* (in press).
3. Schneiter, R., Hollaender, A., Caminita, B. H., Kolb, R. W., Fraser, H. F., DuBuy, H. G., Neal, P. A., and Rosenblum, H. B. *Am. J. Hyg.* (in press).
4. Wheeler, Lt. S. M., Ingraham, Lt. H. S., Hollaender, A., Lill, N. D., Gershon-Cohen, Jr., and Brown, E. W. *A.J.P.H.*, 35, 5:457 (May), 1945.

ALEXANDER HOLLAENDER, PH.D.

*Associate Referee*

## Fungicidal and Fungistatic Agents

### Proposed Method for Testing Fungicides against Trichophyton

The recently increased demand for fungicides to be used in treatment and in combating the spread of dermatophytosis has emphasized the immediate need for a standard method of testing fungicides. The following method is offered to meet this urgent need.

The method is strictly an *in vitro* test and is not intended to provide criteria for judging proficiency in practical use. However, it would seem that concentrations of preparations unable to destroy the organism under conditions of the test would not be suitable as fungicidal agents for general use on inanimate objects and surfaces such as floors contaminated with pathogenic fungi. Products intended for therapeutic use and showing by this test a suitable fungicidal activity must be examined separately for toxicity and irritating properties, ability to penetrate epidermis, and other characteristics important in clinical use.

The method is applicable to water soluble fungicides. Water immiscible materials may be tested, but unless stable dispersions are obtained, reliable checks cannot be expected. It may be desirable to adapt this method to testing fungicides not soluble in water by using some other diluent. Preliminary studies indicate that this may be possible.

The number of conidia in the inoculum (2,500,000 per 5 ml. of fungicide dilution) is not intended as a safety factor to compensate for organic matter or other protective factors to be met in practical application, but was adopted to minimize false negatives resulting from the possibility of picking up loops of material without organisms in the course of conducting the test. It is essential that enough conidia be in the inoculum to permit the making of subtransfers. Otherwise failure to differentiate between fungicidal and fungistatic action may completely invalidate conclusions. The method of detecting fungistatic action by subtransfers is admittedly imperfect. Dilution of the fungicide sufficient to prevent fungistatic action, accomplished by transferring a loopful of the fungicide-conidia mixture into a suitably large volume of broth, becomes impractical in cases where perhaps 1,000 ml. would be required. Therefore the operator must learn by trial within the procedure as outlined, and to some extent for each fungistatic agent tested, a compromise whereby a fair sample of spores is carried to the subtransfer without transferring at the same time enough of the fungistatic agent to inhibit growth in the subtransfer tube.

The use of a phenol control is specified solely for the purpose of providing a standard check upon the resistance of the conidial suspension used in the test. It is generally recognized that it is improper to compare the action of phenol with unrelated fungicidal and bactericidal agents, and it is not intended that in this method the final results be expressed in terms of phenol coefficients.

#### TEST ORGANISM

The test fungus shall be a typical strain of *Trichophyton mentagrophytes* (*T. interdigitale*, *T. gypsum*) isolated from dermatophytosis of the foot. The strain shall sporulate freely on artificial media. The presence of abundant conidia is manifested by a powdery appearance on the surface of a 10 day culture, particularly at the top of an agar slant, and can be confirmed by microscopic examination. The conidia-bearing mycelium should peel easily from the surface of dextrose agar. Conidia of the required resistance shall survive a 10 minute exposure at 20° C. to a phenol dilution of 1:60, but not to one of 1:45.\*

#### CULTURE MEDIA

The fungus shall be carried on agar slants of the following composition: C.P. dextrose 2 per cent, Neopeptone 1 per cent, agar 2 per cent, adjusted\* to pH 5.6-5.8. The same culture medium shall be used in preparing cultures for obtaining a conidial suspension, and a fluid medium of the same nutrient composition (without agar) shall be used to test the viability of conidia after exposure to the fungicide.

#### CARE OF THE FUNGUS STRAIN

A stock culture of the fungus on dextrose agar slants shall be stored at

2-5° C. At intervals not to exceed 3 months it shall be transferred to fresh agar slants which shall be incubated at a temperature between 25° and 30° C. for 10 days and then placed in storage at 2°-5° C. until the next transfer period. No culture which has been kept at room temperature or higher for more than 10 days should be used as a source of inoculum for culture purposes. Cultures may be kept at room temperature for preservation of the strain and for the inoculation of cultures if transferred at intervals not exceeding 10 days.

#### PREPARATION OF THE CONIDIAL SUSPENSION

Petri dish\* agar cultures shall be prepared by planting the inoculum at the center of the agar plate and incubating the cultures at a temperature between 25° and 30° C. for 10 days and not exceeding 14 days. The mycelial mat shall then be removed from the agar surface to a flask containing 20-25 ml. physiological salt solution (0.85 per cent NaCl) per plate by means of a sterile spatula or heavy flattened wire. The conidia are freed from the mycelium by shaking the mixture gently with or without glass beads, and the suspension is filtered so that hyphal elements are removed while conidia pass through. Sterile absorbent cotton in a sterile funnel is suitable. This should yield 10-25 million conidia per ml. The density of the conidial suspension is estimated by counting in a hemocytometer and diluted with physiological salt solution so that it contains 5 million conidia per ml.

#### OPERATING TECHNIQUE

Dilutions of the fungicide are prepared. Methods of making dilutions

\* A suitable strain (No. 9533) has been deposited with the American Type Culture Collection.

\* Bottles 11 cm. high, 4.5 x 6 cm. in cross-section, and with neck 3.5 cm. in diameter can be substituted for Petri dishes.

as outlined in U.S.D.A. *Circular 198* for determination of phenol coefficients are suggested and the test procedures are similar to the procedures outlined therein. Five ml. portions of each fungicide solution and the phenol control solutions are placed in 25 x 150 mm. culture tubes and arranged in order of ascending dilutions. These are placed in a 20° C. water bath until the temperature of the water bath is reached. With a graduated pipette 0.5 ml. of the spore suspension is placed in the first tube of the fungicidal solution, the tube shaken, and immediately replaced in the water bath. Thirty seconds later 0.5 ml. of the conidial suspension is added to the second tube. This procedure is repeated at 30 second intervals for each of the fungicidal dilutions. If more convenient the test

may be run at other time intervals. After 5, 10, and 15 minute periods of exposure to the fungicide, a sample is removed from each conidia-fungicide mixture with a 4 mm. loop and placed in 10 ml. of the dextrose broth mentioned above. To eliminate the risk of faulty results due to the possibility of fungistatic action, subtransfers must be made. This may be done by withdrawing a loopful of the conidia-fungicide mixture, touching it to the surface in a tube of dextrose broth as described above, and immediately immersing it in a second tube of broth. The inoculated tubes are incubated at 25°–30° C. Final results are read after 10 days, although an indicative reading can be made in 4 days.

C. W. EMMONS, PH.D.,

*Associate Referee*

---

## Prepare for Winter Now!

The Solid Fuels Administration for War asks the JOURNAL to request public health workers, particularly health officers and health educators, to inform the public of the tight fuel situation which the population will face this winter.

All fuel will be scarce next winter, the Solid Fuels Administration declares. The need for conservation is urgent and people should be asked to prepare for winter now by doing the following things:

1. "Store now whatever kind and quantity of fuel your dealer can let you have. If you burn coal or coke, don't wait for some preferred kind that may never be available,

or insist on getting more than your fair share. Take your dealer's advice on your coal problems.

2. "Check up on all heating equipment, whether fired by oil, coal, or gas, to insure peak efficiency. Clean your furnace and install controls or other heat-saving devices where available. Learn how to get the full amount of heat from the fuel you use.

3. "Protect your home against loss of heat by installing insulation, storm windows, and weather-stripping. The work can be financed with convenient monthly payments suited to your income on the FHA plan. 'Heat-sealing' pays big dividends by cutting your fuel bills."

Detailed information on saving fuel by heat-sealing houses may be obtained from the Solid Fuels Administration for War, Washington 25, D. C.

# Milk and Milk Products<sup>\*</sup>

## Laboratory Section

THANKS to the constructive discussions that took place on May 5 and 6, 1944, at a joint meeting of this committee with the Committee on Frozen Desserts, various revisions of laboratory procedures are being prepared for presentation to the Section and the Association probably next year.

A section now in process of revision is the one dealing with the sediment testing of milk, cream, butter and cheese. Effective use has been and is being made in many areas of "off the bottom" sediment testing of milk and of qualitative examinations of sediment in butter and cheese. The methods in current use are being incorporated in the text of the proposed new edition of the Dairy Products Report by a subcommittee on sediment testing, Dr. E. H. Parfitt of Chicago, *Chairman*.

Likewise a subcommittee composed of men from laboratories that make extensive use of the methylene blue reduction test has been working on a

revision of the text describing this technic. C. A. Abele of Chicago is Chairman of this subcommittee.

A new section describing the resazurin technic as now used in many milk control laboratories has been prepared by Dr. C. K. Johns of Ottawa, and a new section describing methods for isolating common pathogens from cheese has been prepared by Dr. M. W. Yale of Green Bay, Wis. The need for the latter section has been emphasized by the recognition during the current year of a number of serious epidemics of typhoid fever traced to the eating of uncured cheddar and other types of cheese.

The standardization of the phosphatase test as applied to dairy products is being studied by Dr. J. H. Shrader of Wollaston, Mass.

ROBERT S. BREED, PH.D., *Chairman*, New York State Agricultural Experiment Station, Geneva, N. Y.

---

<sup>\*</sup> Report of the Standard Methods Committee on Milk and Milk Products.

STANDARD METHODS COMMITTEE ON EXAMINATION OF DAIRY PRODUCTS

Organized 1905. Reorganized 1933. Published reports: *Year Books*, 1934-1935, 1935-1936, 1936-1937, 1937-1938, 1938-1939, 1939-1940, 1940-1941, 1941-1942, *A J.P.H.*, May, 1943, Aug., 1944.

8 volumes published: 1910, 1916, 1921, 1923, 1929, 1934, 1939, 1941.

## . Standard Methods for Dairy Products<sup>\*</sup>

THE present (8th) edition of *Standard Methods for the Examination of Dairy Products* is the work

of a group of specialists who have acted as referees and associate referees. Because of this fact, the text has lacked unity. Largely because of constructive criticism from teachers and administrators, a subcommittee composed of Dr. A. H. Robertson and Dr. S. R. Damon have been busily at work

---

<sup>\*</sup> Report of the Joint Editorial Committee for Standard Methods for the Examination of Milk and Milk Products.

<sup>†</sup> Published in Feb., 1945—price in the United States, 10 cents.

during the past year preparing a more unified text for the next edition of this widely used report.

Thanks to the help given by the main office of the Association in preparing and distributing 80 mimeographed copies of the proposed new text and in arranging for a joint meeting of the Committee on Milk and Milk Products and the Committee on Frozen Desserts in New York City, May 5 and 6, 1944, the preliminary manuscript is being further developed. Some new sections are being incorporated and directions are being amplified and arranged in a form that will make the report more useful than it is at present.

Unavoidable delays have occurred in publishing the Spanish translation, a summary of the text of the present edition prepared by Dr. de la Garza Brito with the assistance of other Spanish speaking members of the Association.

It is hoped that all obstacles have now been overcome, and that the printing and distribution of this Spanish edition will take place within the next six months.†

The eighth edition of the Dairy Products Report has been reprinted during the year with certain corrections in the text. These corrections were published in the March, 1944, number of the *American Journal of Public Health*, p. 303. Separate copies of the corrections are available and will be sent to anyone applying to the Association office for them.

R. S. BREED, PH.D., *Chairman*,  
New York State Agricultural  
Experiment Station, Geneva,  
N. Y.

E. M. BAILEY, PH.D.

A. PARKER HITCHENS, M.D.

F. LEE MICKLE, Sc.D.

HENRY T. SCOTT, PH.D.

---

## North Dakota Public Health Association

The Second Annual Meeting of the North Dakota Public Health Association was held in Grand Forks, May 25 and 26. The featured speaker on the program from outside the state was Dr. Haven Emerson of New York City who spoke on Full-time Health Units, based on the work of Dr. Emerson's committee of the A.P.H.A.

The North Dakota Public Health Association went on record as supporting the establishment of the proposed health center at Grand Forks, including a 4 year medical school. The association also went on record as endorsing the establishment of full-time health units in North Dakota in accordance with the American Public Health Association standards, in so far as they can be applied to North Dakota. The associa-

tion decided to put forth increasing effort to affiliate with the American Public Health Association.

Officers for 1945 and Advisory Council members included the following:

*President:* Francis C. Lawler, Sc.D., University of North Dakota, Grand Forks

*Vice-President:* Irene Donovan, State Health Department, Bismarck

*Secretary:* Bernardine Cervinski, State Health Department, Bismarck

*Treasurer:* R. O. Baird, State Laboratories Department, Bismarck

*Advisory Council:* K. C. Lauster, State Health Department, Bismarck; R. G. White, Burke-Ward-McLean Health Unit, Minot; Mrs. Jerome Evanson, Farmer's Union, Jamestown; Everett Lobb, City Health Department, Fargo; Amanda E. Hendrickson, State Teachers' College, Dickinson; Carlyle Onsrud, Welfare Board, Bismarck.

# Report of the Archivist, 1944

## *Laboratory Section*

IN assuming responsibility for the archives of the Laboratory Section from Dr. Wadsworth, I fear that I have undertaken an obligation that will be difficult to fulfil, despite the advantage of the experience of the past nine years, during which I have become familiar with the materials that have been deposited. The plan has been first to garner records and recollections of the early years of the Section, and to defer a complete analysis of them to the time when all that could reasonably be hoped for had been received. Previous reports record the considerable collection deposited by early officers of the Section.

Since 1941 there have been placed in the archives, by action of the Council, the minutes of the meetings of the Section and of the Council; and an account of the work and the final report of the Committee of the Laboratory Section on Educational Qualifications of Laboratory Personnel, William D. Stovall, M.D., *Chairman*. This report is the only document (outside the minutes) regarding a current activity that has been deposited in response to the Council's endeavor to preserve records of, or related to, the transac-

tions of the Section. It is a valuable contribution and I hope it is indicative of future deposits by other committees or individuals. The test of the archival quality of a record is still often taken to be that of age. But any document that forms a part of an official transaction and that should be preserved for official reference should be deposited in the archives as soon as it ceases to be of current use; and not only the specific document but associated and related papers and references.

The office of archivist was established in 1935, and the annual reports to the Section on the status and needs of the collection have been published regularly since then. It would thus seem that all extant early records and correspondence have been deposited and that the time had come when the secondary duties of the archivist might be undertaken; namely, a simple accession or inventory of deposits and, subsequently, a detailed examination of the several items to make them more fully available as historical records or for reference. I hope to make a beginning on this project in the coming year.

ANNA M. SEXTON



# Anthrax in the United States, 1939-1943\*

## *Industrial Hygiene Section*

FIVE years ago we presented a twenty year survey of anthrax in this country, showing statistics divided into four 5 year periods.<sup>1</sup> The present report gives the results of a survey of the past 5 year period, 1939-1943. In 1941 we presented a picture of anthrax in Philadelphia only,<sup>2</sup> showing an increase in anthrax incidence with a change in trend toward a decrease in tannery anthrax and an increase in anthrax due to imported wool and hair. In 1942 we again presented figures for Philadelphia only,<sup>3</sup> showing at least a threefold increase in this wool-and-hair anthrax. The present survey shows that this increase in wool-and-hair anthrax has actually been almost fivefold in the past 5 year period.

In collecting the detailed information for this report we have had much more coöperation from state and local health officers, hospitals, physicians, and industrial plants than ever before. Very few have failed to reply to inquiries, though in some instances much is still to be desired in methods of record keeping and reporting. Mississippi, which in past periods has reported prodigious numbers of cases but could not distinguish between human and animal cases, no longer requires any reporting of anthrax cases "in order to relieve physicians of the burden in reporting more important diseases." Wisconsin is another state which requires no reporting of such cases, but

which, nevertheless, had more or less information on several cases.

New York State Department of Health has kept very excellent records of all cases of anthrax until 1934, but since that time has discontinued all follow-up of cases reported in order to avoid duplication of the same work done by the State Department of Labor; they will, however, resume such follow-up in the future. The Department of Labor knew of only three of the ten bacteriologically-proven 1943 cases, seven of which were very definitely industrial cases, yet this department stated that the reporting of anthrax was more accurate than the reporting of other occupational diseases! This same lack of knowledge of cases in a few other state departments of labor also exists, their chief interest apparently being only in those cases requesting compensation. Some states still continue to report or obtain reports by the numerical card-checking system, so that on follow-up we still find cases of botulism, etc., listed as anthrax.

Nebraska claims no human cases, but with such a very great incidence in animals as is found in this state, it is difficult to believe that no human infections have occurred. Even though their State Department of Agriculture may be doing excellent educational work, one wonders if the human case reporting is as complete as it should be,

\* Report of the Committee on Industrial Anthrax.  
COMMITTEE ON INDUSTRIAL ANTHRAX

Organized 1924. Published reports. *A.J.P.H.* Nov., 1924, Jan., 1926, Feb., 1930, *Year Books* 1934-1935, 1939-1940, 1941-1942, *A.J.P.H.* July, 1943. The two most informative reports, while not published, were mimeographed for distribution by the U. S. Public Health Service—reports of Oct., 1938, and Oct., 1939.<sup>1</sup>

especially since the State Department of Agriculture has made mention of "several human cases."

In a number of states we find reported cases in which diagnoses have been reversed by physicians but which have remained on the records as anthrax. The one state, however, which could give us the least help five years ago, gave us such complete reports this time that no follow-up was necessary. If all states had reported as did Texas, we should have had a most complete survey indeed! And surely the work of obtaining complete records routinely for this disease should not be too burdensome for each state department of health if one man alone, in addition to his regular work, can obtain this information for the whole country! We have found, however, that only through repeated follow-up letters to physicians, hospitals, local health boards, employers, and sometimes even patients, can we obtain an anywhere near accurate picture from the accumulated information sent us by the various state departments of health.

The accompanying table may at first appear complicated, but in order to give a more comprehensive picture of the whole anthrax situation throughout the country, it may prove more enlightening than several less comprehensive tables. This table shows the anthrax incidence and mortality in this country for the past 5 year period by states, by years, and by source of infection, and compares this incidence with that of the previous 5 year period.

In the past 5 year period the source of infection was stated in all but 11 cases, none of these being in states reporting either tannery or woolen-mill anthrax. In the previous 5 year period the source of infection was stated in only 256 of 357 cases, but in the industrial states practically no cases were recorded without source of infection, so that we feel that the reporting of tan-

nery anthrax and textile-mill anthrax gives an accurate picture. Probably the reporting of unusual non-occupational cases is likewise fairly accurate, or at least such a small factor as to influence the total very little, so that we may assume that the greater part of the cases not reported as to source, are due to contact with animals or local animal products, or else have possibly been reported in error, since confirmation has often been impossible.

Among the non-occupational cases we have recorded a few acquired at place of occupation, but not generally considered industrial or agricultural. We have previously recorded several shaving brush cases, but not one of these was recorded in this period, although one death was attributed to a toothbrush, and one case to a hairbrush. Two were attributed to furred coats, one to a wool-lined cap, and one to fur discarded by a taxidermist. One fatality was due to cleaning test-tubes which had contained the organisms in a university laboratory. Three cases were attributed to fertilizer or soil, or at least were acquired while gardening, although one of these was in a mail-carrier in a mill town where there were many cases of anthrax. One fatal pulmonary case occurred in a Navy Yard worker, possibly due to wastes used to wipe machinery. The sources of the remaining five cases were impossible to detect—one fatal pulmonary and bloodstream infection in a 10 year old child in a mining location in a state where animal anthrax had been unknown for ten or more years; one roofer, one hardware merchant, a fireman in a smelting plant, and a student.

Among the agricultural cases we also find a decrease over the previous period, but we feel that these figures are the least accurate of all. There are doubtless many undiagnosed and unreported cases, while, on the other hand, a few cases in animals are occasionally

## INCIDENCE OF ANTHRAX IN THE UNITED STATES

A = Animal Anthrax  
H = Human Anthrax  
+ = Never Reported  
- = Reported in Past Five Years  
++ = " " " and previously  
Exponent Figures = Fatalities

STATE	A	H	NOTES AND EXPLANATIONS	TOTAL CASES BY PERIODS (P <sub>1</sub> Period 39-43, P <sub>2</sub> Period 31-43)										SOURCE OF INFECTION											
				P <sub>1</sub>	P <sub>2</sub>	39	40	41	42	43	HIDES SKINS	WOOL HAIR	AGRI- CUL- TURAL	NON- OCU- PATIONAL	NOT STATED										
U.S.A.				357	408	53	81	94	99	91	97	79	51	237	65	14	16	101	11						
ALA.	++	+		0	2					2															
ARIZ.	0	++		2	1																				
ARK.	++	++		4	4																				
CAL.	++	++		17	11	5	4	1	1	0															
COL.	++	++		5	1																				
CONN.	-	-		2	0																				
DEL.	++	++		18	14	5	1	3	2	2	17	14													
D.C.	0?	+		0	1																				
FLA.	-	-		2	0																				
GA.	++	++		2	5																				
IDAHO	0	?		0	0																				
ILL.	++	++		4	1																				
IND.	++	++		2	0																				
IOWA	-	-		4	4																				
KAS.	-	-		2	0																				
KY.	?	-		0	0																				
L.A.	++	++		18	11																				
ME.	-	++		0	2																				
MD.	++	-		0	0																				
MASS.	++	++		29	27	2	9	6	5	2	27	22													
MICH.	0	-		3	0																				

Case reported from Tempe in '41 was clerical error  
USPHS Reports show 1 case for '40,  
reported in error.  
USPHS Reports show 4 cases for '43 which were  
in reality botulism cases.

USPHS Reports show 3 cases for '39,  
reported in error.  
Diagnosis was reversed in '41 case  
reported to USPHS

See Montana.

1 case reported in '43 was contracted in  
Missouri and treated in Kansas

1 case for '42 reported by USPHS. Was in an-  
imal; 2 in '43 had diagnosis reversed.  
1 case in '41, tannery, later had diagnosis  
reversed; not included here.

1 case for '39 in USPHS Reports was in our '38 report;  
State has no knowledge of '41 '39 case.  
Diagnosis was reversed in one '39 case  
reported by USPHS

State	Year	Number of Cases	Notes
MINN.	1943	1	Anthrax not reportable.
MISS.	1943	38	See Kas. re '43 case. One USPHS '41 case not known to State. Diag. of 1 '42 case disputed but included in table where disease is unknown in animals.
MO.	1943	1	Is reporting complete? Anthrax very prevalent in animals.
MONT.	1943	2	
NEB.	1943	2	
NEV.	1943	0	
N.H.	1943	0	Only 6 cases in U.S.P.H.S. Reports, all in '43.
N.J.	1943	35	Only 48 cases were reported by USPHS, one of which included + was treated in Phila., so omitted here + in Phila. but resisted + were treated in N.J. (See Penna.)
N.M.	1943	55	USPHS Reports include 2 '42 cases not known to State or City
N.Y.	1943	1	USPHS Reports included 1 case for '41; none for '42.
N.C.	1943	2	
N.D.	1943	2	USPHS Reports show 1 case in '40 + 1 in '42. State cannot confirm.
OHIO	1943	9	
OKLA.	1943	2	
ORE.	1943	1	Phila. records accurate (935) but State records rather inaccurate and omitted fatalities City and State records omitted in N.J. so omitted here. One case in Phila. + treated in N.J. so omitted here. (See N.J.)
PENNA.	1943	44	
R.I.	1943	0	
S.C.	1943	0	
S.D.	1943	15	Decrease attributed to campaign for animal vaccination.
TENN.	1943	0	State reports one death; but M.D. denies diagnosis ("pyogenic infection")
TEXAS	1943	43	
UTAH	1943	1	
VT.	1943	2	
VA.	1943	0	USPHS Reports show one case from Spokane, '43. District Health Officer cannot confirm.
WASH.	1943	3	But a case in same county was earlier confirmed. Anthrax not reportable, but State had information on 3 cases; Dept. of Ag. on 2 cases, and USPHS reported one case from Milwaukee not confirmed.
W. VA.	1943	10	
WIS.	1943	1	
WYO.	1943	1	

reported as human cases. In one instance the state health department had reported a case in enough detail to give name and address of patient and source of infection, but follow-up proved that "this case was two calves on the farm of the presumed patient." Missouri appears to be the only state in which animal anthrax has been reported for the first time, though from reports of human cases in previous periods we suspect that unreported animal anthrax may have existed earlier. Undoubtedly the apparent decrease in human cases due to animal contact has been due to the active campaigns of departments of agriculture for animal vaccination. On the other hand, many isolated outbreaks of animal anthrax in the past few years have quite probably been due to the importation of bone meal, which state officials and users have felt to be safe because they have met the regulations of the U. S. Bureau of Animal Industry. These regulations, however, were designed to control other diseases, and are entirely inadequate to eliminate anthrax spores. Thus anthrax may have been introduced into many new localities through the oversight of our Bureau of Animal Industry.

We have collected a mass of information from all of the states concerning the control of anthrax in animals, and the degree to which the departments of agriculture coöperate in trying to prevent human anthrax, but since this is not of primary interest to an industrial group such as this, and since it would be impossible to handle it adequately here, it is felt that another paper on this phase, published in an agricultural or livestock journal early in the spring, would accomplish much more than a detailed discussion here. There are, however, one or two points which we should perhaps mention briefly here concerning the frequent lack of co-operation between our agricultural and

health agencies. In one state which always has a great deal of agricultural anthrax, the livestock sanitary board, in its zeal to obtain positive confirmation of anthrax in animals, has published instructions to stockowners suggesting that when an animal dies a few drops of blood be smeared on glass and mailed to the laboratory. There is no warning included which would protect the stockowner from becoming infected during this process, and slides so prepared, if the package should become unwrapped in transit, could possibly disseminate infection. This same publication also advocates deep burial of carcasses but does not mention the use of lime, although several cases have resulted from unearthed carcasses.

Another concern of the health agencies should be the availability of adequate treatment in areas where agricultural anthrax is likely to occur. I mention later the question of whether or not serum is necessary, but in the past when it has been so considered, it has often been unavailable until too late to be effective.

A third need requiring coöperation between these two agencies relates to the proper disposal of infected animal products. In several instances infected meat (usually horse) has produced anthrax in circus animals, zoos, and minkeries; and butchers and animal handlers have become infected. Several cases such as those mentioned in California, show that such infected local products as cattle hides and dead wool do reach industrial tanneries and textile plants in spite of Bureau of Animal Industry regulations to the contrary. In one instance mink skins from infected animals were allowed to be sold to unrecorded markets after being submitted to a bichloride of mercury treatment recommended by the U. S. Bureau of Animal Industry, but proved by us to be ineffective against anthrax. Although no cases proved to have resulted

from these furs have been noted, it is possible that some of our cases in which no source could be found may have been due to these. There is a very real need for much closer coöperation between federal, state, and local health and agricultural agencies than at present exists.

Anthrax due to imported hides and skins is almost entirely tannery anthrax, although we have included here a few cases in those handling these materials in transit, and outside machinists and workmen called in to make plant repairs. With the exception of an occasional tannery in states dealing with local products, these are located chiefly in five states—Delaware, Massachusetts, New Jersey, New York, and Pennsylvania. The decrease we note in tannery anthrax, while doubtless accurate, lends a very false sense of security because in the present war emergency very few goatskins, which are probably the cause of more than 90 per cent of the tannery anthrax, are being processed, and most of the stock handled consists of the more durable cattle hides obtained largely from healthy animals killed for food. Under certain conditions of moisture followed by heat, as exist in many countries exporting goatskins, anthrax organisms may multiply rapidly. As in the last war, baled skins, for lack of transportation, may remain stacked on docks and in leaky warehouses until whole bales have become permeated with organisms originating perhaps from only one infected skin in the bale. There is, therefore, sure to be a sharp rise in the incidence of tannery anthrax as soon as there is again a demand for fancy shoes and these accumulated skins are imported and processed by the tanneries.

Tanneries are also lulled to a false sense of security by the glaringly inadequate regulations of our U. S. Bureau of Animal Industry concerning impor-

tations of hides and skins. We have pointed out so many times the complete worthlessness of consular certificates to the effect that no anthrax exists where skins originate, that it seems hardly necessary to repeat it again, and all other regulations are designed against other infections, being wholly inadequate as to anthrax. Previous regulations did at least attempt to prevent soil infection from tannery wastes by the lime-soak and bichloride methods and disinfection of effluents, but since these were found ineffective, they were discarded. The very fact that these regulations were withdrawn, however, led tanners to feel that anthrax was no longer a hazard.

If we wish to be forward-looking and prevent the increase in tannery anthrax which is certain to follow the close of the war with return to normal production and consumption, we must immediately undertake research which will produce an adequate method of sterilizing hides and skins before they are handled or processed, and our tanners should be made aware of this need.

In spite of the inclusion in our previous 5 year figures of an unusual number of cases from Mississippi, Texas, and West Virginia which could not be confirmed and may well be questioned as true cases, we still show a 16. per cent increase in total number of human cases of anthrax in this country. Actually this increase may have been greater still, even though both agricultural and tannery anthrax showed decreases. This is due to a 365 per cent or nearly fivefold increase in anthrax due to imported wool and hair. Nearly all of this is in textile mills and a few brush-making establishments, although as in the case of tannery anthrax, we have included a few handlers in transit, outside machinists, etc. We have also included here a unique group of cases in New Jersey resulting from the use as fertilizer of wool wastes col-

lected at woolen mills. Since most of these cases occurred in plants where both wool and hair from numerous foreign countries, all known to have much animal anthrax, were being processed at the same time, no separation of the two as sources of infection could be made with any degree of accuracy; hence they are grouped together. With only two exceptions these cases were also concentrated in five states—Massachusetts, New Hampshire, New Jersey, New York, and Pennsylvania.

After all that we have said and continually repeated during the past twenty years concerning the certainty of such an increase and the reasons therefor, we hardly need state that all of this could have been prevented if we had established such a government disinfecting station as England has so successfully operated since 1921.

The remarks I have made as to Bureau of Animal Industry regulations concerning hides and skins are equally true of wool. The regulations are practically identical for both materials, and entirely inefficient in protecting against anthrax. Yet I know from letters received that many state, local, and plant officials feel that because these regulations have been complied with, they have been protected by the government.

We have been trying for years to interest the U. S. Public Health Service in the disinfection of wool and hair at port of entry, but they have never felt this disease to be important enough to warrant their attention. It is true that the Industrial Hygiene Division of the Public Health Service, through the interest of Section members who were in authority in this Division, mimeographed for free distribution two of our Committee reports, for which we were most grateful, but that seems to be the extent of the interest taken. Because the Public Health Service had ceased to obtain detailed information on cases,

and were merely receiving numerical reports of cases as city or state health officers saw fit to send them in, we mistakenly stated in 1942 that the Public Health Service no longer required the reporting of anthrax to them. Dr. E. R. Coffey, then Assistant Surgeon General in charge of the since discontinued Division of Sanitary Reports and Statistics, requested a correction of this statement, which was made, but we still feel that to date our Public Health Service has not been interested in this problem. Dr. Coffey stated that the numerical reports received by him were published in the U. S. *Public Health Reports*, but that no attempt was made to confirm these except "in the case of an unusual outbreak," when an attempt is made to secure more detailed information as to location and source of infection. In considering the inadequacy of Bureau of Animal Industry regulations, Dr. Coffey suggested that it might be possible that an amendment to the Foreign Quarantine Regulations could be prepared to cover importation of wool, hides, etc., in a manner similar to that covering importation of hair and bristles for shaving brushes, but that it might be considered more advisable for the prevention of anthrax to be handled by appropriate industrial hygiene measures in the industries involved. In our 1942 report we suggested that the English method of disinfection might be adaptable to individual mills in combination with their wool-scouring process, but after personal visits to such mills we find that this would be entirely out of the question since the cost of expansion to include such a disinfecting set-up would be prohibitive for the individual mill, especially if that mill had to compete with another who refused to follow suit.

Certainly if our Public Health Service intended to take action on "cases of unusual outbreaks," it should have taken such action when wool-and-hair

anthrax showed a fivefold increase, but because of a decrease in tannery and agricultural anthrax, and because they have no interest in collecting information as to source, they were apparently blissfully ignorant of this condition. It is also certain that if they have no intention of handling the problem at port of entry where protection would be afforded all handlers all the way along, but expected the disease to be prevented "through appropriate industrial hygiene measures in the industries involved," they should definitely be prepared to give such industries an adequate answer upon requests from them as to how they can so protect themselves.

I know of at least one mill who, upon appealing to the Public Health Service for instruction as to how they might avoid further infections, was merely referred to this Committee—an entirely voluntary agency, unfinanced, and with no facilities for research. It should be the duty of the U. S. Public Health Service either to establish a port-of-entry disinfecting station, or to undertake research which could give our industrial officials an answer as to how they can protect themselves. Yet, in reply to a letter this spring to Surgeon General Parran expressing concern over the huge government stockpile of foreign wool which is being released for sale and used in government clothing, etc., and which is a tremendous potential anthrax hazard, J. K. Hoskins, Chief of the Sanitary Engineering Division wrote that "at a discussion of the proper committee at the Annual Conference of State and Territorial Health Officers it was decided that steps toward establishment of wool disinfection stations should not be undertaken at this time. We are, therefore, not in a position to pursue this matter further at present." It is natural that such an organization would have little interest since all but two of

our wool-and-hair anthrax cases have occurred in only five states.

We are now getting bacteriological confirmation of practically all of our industrial cases. These are for the most part handled by physicians and hospitals who see so many cases that this work has become routine. It is another matter, however, for those who see only a case or two in their whole experience, and for them particularly, we wish to say that consideration of known exposure, clinical picture, and bacteriological results should all be weighed in making a diagnosis. It is quite possible for a technician unfamiliar with the procedure to obtain negative cultures or smears from a positive case; but it is equally possible that such examination may reveal an anthrax infection where it is least expected. Wherever the slightest doubt exists, however, treatment should be started immediately, without waiting for bacteriological confirmation or further development of a typical lesion.

When this committee was first formed about twenty-five years ago, the accepted method of treatment consisted of excision and phenol injections. Later, anti-anthrax serum came into use, both locally and intravenously. With its advent the fatality rate decreased sharply, but serum-sickness and sharp reactions have so frequently occurred that physicians are now turning more and more to chemotherapy—arsenicals or sulfa-drugs—with a definite policy of "hands off the local lesion," and they seem to have produced as good or better results than they did with the serum. A few have just begun to try penicillin, but not enough from which to draw any opinion as to its efficacy. From several physicians who have each treated numerous cases in this past 5 year period with apparently equally good results, we have received quite emphatic recommendations for their own method and denouncement of the other



methods. One treats entirely by local injections of serum and has kept many on the job throughout, with no time loss. Another prefers nearsphenamine, with serum only in the most serious cases. A third prefers sulfathiazole by mouth, while still others feel that only serum should be used. There are still too few cases treated by each method to draw statistical conclusions, but certain it is that the fatality rate of anthrax from all sources (influenced largely this time by the great number of textile-mill cases) has dropped to only 8 per cent—practically one-half that of the previous 5 year period. We cannot attribute this to less virulent infections, since we still find fatalities high among those handlers of foreign animal products in whom diagnosis and treatment were not prompt. From the data at hand it would appear, therefore, that the chief factors are promptness and rigorousness of treatment. If the sulfathiazole treatment continues to give as good results as it seems to have given so far, it would be the most easily available and administered treatment yet considered.

Until we can produce satisfactory sterilization of foreign hides, skins, wool and hair, we shall continue to have industrial anthrax in our tanneries and textile mills, and the only means of control until that time, must depend not only upon protective clothing, personal hygiene, and "good housekeeping," such as we have frequently discussed in earlier reports, but especially upon eternal vigilance by foremen and plant officials, and constant education

of employees, to detect and immediately report the very smallest of lesions. If there is the slightest suspicion of anthrax it might well be advisable to administer an initial dose of sulfathiazole even before diagnosis is made.

Even though we have reports of a few cases which have lost no time or only a few days, by far the greater number of cases are hospitalized at least two or three weeks, and lose from one month up to five months from work. Indemnity and medical costs paid for such cases average well over \$300 each, and some of them go into the thousands, to say nothing of the thousands of dollars paid in fatal cases. Neither do these figures take into consideration the loss in production due to these cases. It may readily be seen, therefore, that these cases represent no small economic loss.

We would suggest that, in view of present conditions as here set forth, the Industrial Hygiene Section consider the advisability of requesting the U. S. Public Health Service to reconsider its actions and take steps to plan for the sterilization of imported wool and hair at entry ports, and to make further efforts to develop a satisfactory method of so treating imported hides and skins.

#### REFERENCES

1. A Twenty Year Survey of Anthrax in the United States, 1939. Mimeo. U. S. Public Health Service.
2. Anthrax in Philadelphia. *A.P.H.A. Year Book 1941-1942*, p. 114.
3. Check Anthrax—A Warning and a Plea. *A.J.P.H.*, 33, 7:854 (July), 1943.

HENRY FIELD SMYTH, M.D., DR. P.H.,  
Chairman, Box 232, Pocasset, Mass.  
WALTER D. HIGGINS, M.D.

# Utilization of Commercial Advertising for Health Education\*

## *Public Health Education Section*

THE vast resources of the commercial world which might be available for public health education are largely ignored, by public and voluntary agencies whose primary concern is the health of the American people. On the other hand, business recognizes the value to itself of incorporating health education material in its advertising and promotional literature—some of it good and some of it bad. For instance, full-page advertisements in national magazines appear regularly under the sponsorship of various life insurance companies, food interests, drug manufacturers, and other advertisers, containing messages on health subjects, usually without assistance from professional health workers.

As a result of the discussion of this situation at the 1943 Annual Meeting † this committee was created to explore the possibility of developing a program which could utilize these resources of commercial advertising for health edu-

cation. Your committee has discussed this problem and, although it is not yet ready to recommend a complete and detailed program, we are agreed that the Association should: (1) encourage advertisers to incorporate authentic health messages in their advertising material; (2) develop and promulgate criteria for evaluating the claims of advertisers in public health matters; and (3) consider the possibility of developing a service for commercial advertisers that will advise them concerning the most urgently needed health messages and aid them in expressing these messages accurately.

In view of the necessity for exploring this problem further, the committee recommends its continuance.

DAVID RESNICK, *Chairman*, 1790

Broadway, New York, N. Y.

MURIEL F. BLISS, PH.D.

EDWARD F. BROWN

HOMER N. CALVER

KENNETH W. GRIMLEY, C.E.

ANN W. HAYNES

S. S. LIFSON

RAYMOND S. PATTERSON, PH.D.

PHILIP S. PLATT, PH.D.

---

\* Committee organized 1943.

† Calver, Homer N. Resources of Industry for Health Education. *A.J.P.H.*, 34, 5:489 (May), 1944

---

## Institute in Health Education

Announcement has recently been received of an Institute in Health Education planned for representatives of Negro colleges. The institute will be conducted jointly by the Office of Education and the Public Health Service, and will be held at Carver Hall, How-

ard University, August 13-25. In addition to outstanding presentations on health problems, the various representatives of the Negro colleges will discuss how they can utilize the material that they have gathered in their own colleges when they return.

## Credit Lines

### A DENTAL CARE PROGRAM

#### *As a Dentist and a Dental Tradesman See It*

An interesting illustration of social awareness by a commercial organization is represented by two recent numbers of Ticonium, a publication of a firm making prosthetic dentistry materials. One is "A basic Plan for the Protection of the Public and the Dentists in Social Programs," by Donald C. MacQueen, D.D.S., of Los Angeles. Here the author recognizes and welcomes the inevitability of group health insurance as an expression of the acceptance of health as a community responsibility, just as responsibility for education has already long been accepted. Citing in forthright and vigorous language, chapter and verse of the "vested interests" opposition by the American Medical Association to tax-maintained health programs, Dr. MacQueen says "These instances of poor public relations should prove to the dental profession the inadvisability of tying dentistry's star to the political movements of organized physicians." He then suggests the development of a pilot plan to justify a plan of adequate acceptable dentistry in a public health program, the man power requirements, the training of auxiliary personnel, and graduate training of dentists.

The second noteworthy publication is in Ticonium's *Notes and Quotes*, an article on "The Business Side of Dentistry in Health Insurance." by J. J. Nevin, who is the promotional manager of the dental prosthetic firm. He speaks as a dental tradesman who is expressing his concern for the future of dentistry. He deplores that recent polls on the Wagner-Murray-Dingell Bill

conducted by two dental magazines show "that the public can expect little assistance from dentistry in its plans to extend health benefits through programs that are economically convenient." He reminds the profession that *Fortune Magazine* and Gallup polls indicate that 75 per cent or more of our people are willing to pay for medical and dental care in the form of taxes; that numerous bills for medical care insurance have been introduced into many state legislatures, and that "no piece of legislation continues to arise in our national and state bodies that does not have the support of public opinion."

Apropos of the Wagner Bill he says further: "What the dental profession thinks of the Wagner Bill or other programs of compulsory health insurance is less important than what the public thinks of dentistry. Dentists, with public approval, operate as a legalized monopoly. As long as the public approves the arrangement, dentists can determine who enters the business of dentistry, set up their own qualifications, discipline their members, and establish dissimilar and non-comparative prices for their services, and hold the quality of their services subject not to consumers' opinions but to their own. Dentists enjoy these unusual privileges because the public believes that dentistry is one of the custodians of its most valued possessions—health. If the public is ever taught to believe that the privileges of this monopoly are being abused for personal gain, dentists may find themselves as completely regulated as the public utilities."

From the standpoint of the business side of dentistry the author points out various areas in which organized den-

tistry has been shortsighted. Among them are the opposition of many dentists to hygienists, as indicated by a heated controversy on this subject in recent issues of the *Texas Dental Journal*. Mr. Nevin says "With dentists busier than they have ever been, here are men who are still fearful that the time may come again when cleaning of teeth will be welcome and who are worried about hygienists taking business from one office to another."

Another illustration of shortsighted policy is the profession's recommendations for industrial dentists. Without any apparent recognition of the right of labor and management to some say as to the scope of the industrial dentist's work, the profession has already laid down the principle that the industrial dentist must confine himself to dental health education, examination and emergency work.

A third illustration is the action of dental societies in several cities with respect to the dental health programs of schools, whereby schools have been compelled to limit their work to education and examinations and refer all treatment activities to the private dentists, who have then failed to care for children adequately.

In discussing the relation of dental service to coming medical care programs, Mr. Nevin points out that dentistry has never been as well sold as medical services which, in public opinion, are synonymous with health care. At present dentistry serves less than one-fourth of our people. Therefore, if tomorrow, dentistry were made everybody's free right through a compulsory health insurance program, it would be difficult to determine how many more dentists would be required. An extensive educational campaign would be required before dentistry would be accepted in such a plan as medical care. The author further points out that when dentists begin on this

belated planning, the lack of which may already have prejudiced dentistry unfavorably for a long time in the future, the dentists must reexamine the relation between "adequate" and "cosmetic" dentistry, as well as present dental economics whereby the dentist's livelihood comes not so much from his professional skill as from his middleman's profit from prosthetic dentistry.

#### PUBLIC MEDICAL CARE IN A PUBLIC AFFAIRS PAMPHLET

Readers will be glad to have Professor Winslow's "Health Care for Americans," the latest Public Affairs Pamphlet, published in May. Here is a succinct statement by a noted public health leader of the extent to which citizens of the United States lack medical care and of the kind of national health program that will fill the need.

The findings of the Committee on the Costs of Medical Care are summarized and illustrated with pictographs indicating that one-third of the people lack adequate medical care, two-fifths adequate dental care. The contribution of Blue Cross plans and voluntary health insurance to the development of a national health program is assessed and given full recognition.

Professor Winslow summarizes the Principles of a Nation-wide Health Program adopted by the Health Program Conference of 1944, made up of 29 of the leading experts in the field of medical care—13 physicians, 6 economists, 2 labor representatives, and 8 administrators of official or voluntary health agencies. Reviewed also is the 1944 official statement of the American Public Health Association, *Medical Care in a National Health Program*. Both stress the need for complete medical care—preventive, diagnostic, and curative—for all the people.

The publication of this pamphlet is testimony, if any were needed, that a national program of medical care has

come out of the area of philosophic discussion into that of practical planning for ways and means.

#### A NEW FIRST—MASSACHUSETTS HEALTH WEEK

Dr. Vlado A. Getting, Health Commissioner of Massachusetts, sends news of the State's first Annual Health Week celebrated from May 7 to 12. A rallying program was held as physicians, nurses, dentists, and other health and civic groups banded together to bring home to the public the vital need for the positive maintenance of good health as a means of fighting off disease and preventing unnecessary illness.

As proclaimed by Governor Maurice J. Tobin, the week was devoted to a Medical Day, Dental Day, Community Health Day, Public Health Day, School Health Day, and a Hospital Day, the last coinciding with National Hospital Day.

News releases, pictures, radio broadcasts, spot announcements, and other media helped carry the health message. Labor and industrial groups, school children, women's clubs, boards of health, the Army and Navy, Red Cross, dental, medical, public health, and other groups helped stimulate activities and promote observance on a local level.

A total of 25,000 Gubernatorial proclamation posters was displayed throughout the state and at least twenty radio broadcasts featuring prominent health personalities were given, not to mention sustaining programs which helped carry health information to home-makers and other regular audiences.

Among the material distributed was a pink pamphlet humorously illustrated and titled "Are you Being Misled? Vitamin Pills. Facts vs. Fads," and "Introducing You To" which includes a map of the state showing the eight state districts, together with information on the services available from

the state districts in coöperation with local health officers.

#### PUBLIC HEALTH MANUAL OF THE U. S. JUNIOR CHAMBER OF COMMERCE

The Public Health Committee of the U. S. Junior Chamber of Commerce has recently published a manual of public health through the auspices of the Public Health Committee, of which Alfred E. Kessler, M.S.P.H., of Denver, is Chairman.

This manual outlines several possible approaches which the local Junior Chambers of Commerce can undertake to improve the health of their communities. The first suggestion relates to an evaluation of the health department made in coöperation with the Committee on Administrative Practice, American Public Health Association, and the *Evaluation Schedule*. Other chapters include a men's hospital volunteer corps, a program of industrial mental health, a venereal disease program, a proposal for sex education for boys and girls, a program of Red Cross activities, a project for tuberculosis control, a venture in post-war medical planning, programs in rat control, on health education through the radio, on sanitary food inspection, on physical fitness in industry, and on child dental health.

This is the most comprehensive and ambitious program of any of the national organizations of the luncheon club type. The Junior Chamber and its Health Chairman, Mr. Kessler, are to be congratulated on this publication which was made available through the interest and support of the Minneapolis-Honeywell Company.

#### BRITISH COLUMBIA REVISES ITS SCHOOL ROUTINES

Credit Lines is indebted to George M. Wheatley, M.D., Secretary of the A.P.H.A. School Health Section for the following:

"I have just had the good fortune to see the 31st, 32nd, and 33rd reports of the Medical Inspection of Schools for the years 1942, 1943, and 1944 of the Province of British Columbia as reported by Dr. G. F. Amyot, Provincial Health Officer. Public health workers and school officials should see this report. It reviews the steps taken to reorganize the school health service to meet war conditions and describes the changes in school health policies which have occurred in British Columbia since 1911. Administrators of school health service will want to read about the recent revision of records and report forms and the rôle that the school health service now plays in the community health program.

"Among the developments reported is a new method of reporting physical status. This is a wholesome departure from the traditional statistics on physical defects. Each child's general condition or physical status may be classified under three major groups, A, B, and C. For each of these three major groups are two sub-classifications indicated by d or e, depending upon whether the child has a physical defect or an unsatisfactory environmental factor is present. For example, a child classified as 'A' is one who enjoys an average satisfactory state of health. If a child is classified as 'Ad,' this denotes an average satisfactory state of health, with a slight physical defect which does not affect his general health. When a child's physical condition is classified as 'Ae,' it denotes a good average condition of health in spite of an unsatisfactory environmental factor. When a child's condition is classified as 'Bd' this denotes a moderate impairment of health due to some physical defect in the pupil. Classification of 'Ce' denotes a condition much below par due to external causes which might include heredity as well as environment. This new system has been in operation

for about two years. Dr. Amyot reports that the bulk of the school children in the Province have been placed in the first two physical status classifications. Approximately 49 per cent in Grade 'A' and approximately 35 per cent in Grade 'Ad.' He states that 'the percentage of children placed in physical category "A" shows a steady rise from 37 per cent in Grade 1 to 60 per cent in Grades 10-13 inclusive. The pupils in physical category "Ad" show a steady decline from 42 per cent in Grade 1 to 27 per cent in the higher grades.' Dr. Amyot is inclined to believe that this improvement in physical status is due to the work of the Health Units and public health nursing services throughout the Province, although he cautions that these percentage figures should not be used too literally. The apparent improvement in physical status may be because the school medical examiners were using a new system and were not entirely familiar with its implications. Urban municipalities in general show a somewhat lower percentage of pupils of 'A' classification for all grades and a significantly higher percentage of pupils in 'Ad' classification than do rural areas.

"In short, Dr. Amyot has given us one of the most intelligent reports on school medical service that we have seen in some years. It reminds us of the valuable reports on school medical service which prior to the war we received from the Chief School Medical Officer of Great Britain."

#### LORAIN COUNTY, OHIO, CELEBRATES 25 YEARS OF THE HEALTH DEPARTMENT

The 25th anniversary of the establishment of the Lorain County District Health Department was celebrated in Oberlin on May 7 with a dinner at which the principal address was made by William A. McIntosh, M.D., of the staff of the International Health Division, Rockefeller Foundation. His

offices are now in Toronto. W. R. Morrison, M.D., Oberlin, is President of the Board of Health and F. W. Vincent, M.D., the Acting Health Commissioner.

During these years, in addition to Dr. McIntosh, health commissioners in Lorain County included I. C. Riffin, M.D., now State Health Officer of Virginia, C. D. Barrett, M.D., now Director of the Ingham County, Michigan, Health Department, H. R. O'Brien, now Senior Surgeon, Reserve, U. S. Public Health Service at the UNRRA office in Sidney, Australia, F. R. Dew, M.D. (now deceased), and L. E. Kerr, M.D., Surgeon (R), U. S. Public Health Service.

The annual report of the department is built around this event and is worth acquiring by any who may be planning similar occasions.

#### MORE ABOUT ANNUAL REPORTS

The Chicago Council of Social Agencies has tried a new type of annual report which it calls "The Marching Year of 1944: A Pageant in Twelve Months." In twelve brief pages it reports, month by month, headline news of its various activities—programs started as well as aims accomplished. That the Council lives in the modern world is attested to by such notes as:

Labor representative talks to the Publicity Council on "Labor-Welfare Participation—A Two-Way Street" . . . We spend a pleasant and profitable Sunday in conference with representatives of organized labor discussing labor-welfare coöperation in community planning . . . Our Committee on Organized Labor and Community Planning carries on through the summer . . . The Health Division requests organized labor to suggest representatives to serve on several important Committees . . . Clinics begin statistical reporting of nutrition services . . . The Clinic Nutritionists visit neighborhood stores to get a line on prices . . . Planning also

goes forward on better dental service for children . . . We complete a plan for dental care for preschool children . . . Our survey of personnel practices and salaries, covering 5,583 employees and 155 agencies, is released . . . Inter-racial tension rises. Agencies represented on our Committee on Minority Groups begin to study their own practices, and our Publicity Council carries on its "work-shop" project on "what a public relations program can do about race prejudice" by discussing examples of prejudice and discrimination in our own agencies . . . The Chicago Housing Authority asks our help in meeting the urgent need of its Negro tenants for hospital care . . . The Cook County Bureau of Public Welfare asks our help in securing care for wives and infants of Negro service men in hospitals of their own choice. We plan with the Hospital Council to increase the number of beds available for this purpose. . . .

In presenting the report the Council says, "We might have told this story by departments, but that would put the emphasis on the mechanics of our work. We might have told you only of completed business, but much that we do is never finished—as a tree is never finished, or a city, or anything that lives and grows."

#### NEW HAVEN HOUSING AUTHORITY

The sixth annual report of the Housing Authority of the City of New Haven, recently published, is an excellent example of a meaningful report by a public body to its constituency. With pictures, charts, and good typography, it tells what the Authority has done in providing public housing, how rents have been related to income and how taxes have been affected in the six years of the Authority's existence.

Two-thirds of the report deals with the problem of the future. With a scholarly analysis of population trends,

housing and related conditions, and of the possible areas for rebuilding, this section constitutes a basic document in city planning as well as in the implementation of the hygienic ideals that have been developed for housing of today—and tomorrow.

#### HOME ACCIDENT FATALITIES INCREASE AMONG PRESCHOOL CHILDREN

If further reason were needed to justify the emphasis on home safety as an activity of health departments by the Subcommittee on Accident Prevention of the A.P.H.A.'s Committee on Administrative Practice, this headline in the February issue of the Metropolitan Life Insurance Company's *Statistical Bulletin* would furnish it. A two-fifths rise in the death rate from home accidents among boys and girls 1 to 4 years of age in the three years 1942-1944 over the three pre-war years 1939-1941 is startling news. The most frequent causes of 2,500 home accident fatalities in 1942 were burns or scalds which accounted for more than one-half, ingestion of poison compounds was second with 14 per cent, and falls were third with 10 per cent. These suggest a host of preventive measures; putting kitchen equipment in proper condition, keeping matches out of reach, cleaning and organizing the family medicine chest and keeping insecticides, cleaning fluids and other poisons under lock and key, anchoring rugs or loose stair steps, and guarding low windows. A whole program for a committee on home accidents could be built on this one article were there not a wealth of other data to give point to this coöperative venture with the National Safety Council.

#### NEGRO PHYSICIANS IN THE UNITED STATES

The January *Bulletin of the History*

*of Medicine* has "An Account of Physicians of Color in the United States," by Col. M. O. Bousfield, M.C. Col. Bousfield is a Fellow of the A.P.H.A. and was Assistant Director of Medical Services of the Julius Rosenwald Fund until called to the Army early in the war. His article is an exciting story of Negro medical education and of the Negroes who became great doctors in spite of prejudice, ridicule, and closed doors.

#### MILK, FOOD AND RESTAURANT SANITATION

The Sanitary Engineering Division of the U. S. Public Health Service continues its useful aid to sanitation education. At hand are two lists from the Milk and Food Section, one of films relating to milk and food sanitation classified as to audience for which designed, and another of references on restaurant sanitation which methodically cover the literature from 1920 or thereabout to date.

#### COMMERCE SPEAKS UP FOR THE LOCAL HEALTH OFFICERS

Sealright (sanitary paper milk bottle hoods) sends us an interesting brochure of copies of a baker's dozen of ads in recent issues of *Collier's*, *Life*, *Time*, and *Saturday Evening Post*. With appropriate classical quotations such as Emerson's "The first wealth is health," the series tells the story of the local health officer—how he has conquered diphtheria, tracks down hidden sources of infection in the environment, and adjusts his techniques to the changing sources of health dangers. The sign-off line is always, in one form or another, "Your local health officer needs and deserves your support." Some of the advertisements were published in the *Journal*.



## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method—By the Committee on the Hygiene of Housing, A.P.H.A. New York, A.P.H.A., 1945. 71 pp. Price, \$1.00.**

When the Committee on the Hygiene of Housing was created it marked one of the milestones in the recognition of housing as a positive factor in raising "the physical and emotional and social vigor and efficiency and satisfaction" of the population. The committee has contributed significant analyses in this field, all tending to clarify concepts of good and bad housing and to isolate the significant characteristics of such structures. Throughout its activities it was early aware of the fact that true progress in amelioration of our multiple housing difficulties would be largely made only when appropriate tools of objective measurement could be made available. The layman may feel that his concept of "bad housing" is sufficient for law enforcement, for city planning, for demolition, for subsidy, for rent control, etc. The investigator, however scientific in his approach, has always been confronted with a motley of qualitative criteria, many of which were frequently competitive with each other, some of which were unreasonable and arbitrary and few of which had been adequately standardized for measurement, as in other fields of private and public activity, such as water supplies, dairies, food establishments and the like.

The present publication represents a brief summary of the results of the committee's important activities during the past four years in the preparation of such tools. It believes that it has devised a technique for inspecting and evaluating the health qualities of housing, which is simple, objective, and susceptible to wide application under technical supervision.

It recommends the substitution of such an objective appraisal of the dwelling and of its environment for the qualitative and frequently emotional criteria which have so often prevailed in the past.

By such a standardized procedure the committee offers likewise a basis of comparison between areas, between communities, between rental classifications or any other fields in which comparison is essential for intelligent policy and action.

In a city such as Baltimore for example, the standards and procedures of the health department, the building department, the fire department, the city plan commission and other agencies are all different. The common language which is one of the first prerequisites to mutual understanding has not yet been evolved. The same situation prevails in virtually every important city in the United States.

The instrument which is described in this publication is one which should be welcomed by all private and official agencies interested in moving forward on a common base in this post-war field of transcending importance. No one doubts that housing construction after the war will sweep the United States,

carrying with it, as the committee properly points out, "vast opportunities for bringing men, materials and machines together to create durable wealth and social gain." Any intelligent operation in the field should and must rest upon the application of reasonable criteria of what we mean by acceptable and unacceptable housing.

The monograph provides an appraisal form for such purposes and a detailed application of such an appraisal form to the City of New Haven, Conn. Every worker in the field of public health should give careful study to the document. It is one of the major contributions to translating opinions into objective measurement in one of the most difficult fields of appraisal. Every health officer should introduce it as promptly as possible to all of his coworkers throughout the United States, so that his conclusions may be matched by the same units of measurement with those of the building department, the fire department, the city plan commission, the department of welfare, the law department, and all other agencies, private or public, whose common purpose is the elimination of slums, blighted areas and substandard dwellings for every sector of the population.

ABEL WOLMAN

**Tuberculosis in the United States, Graphic Presentation, Vol. 2—By Medical Research Committee, National Tuberculosis Association. New York: National Tuberculosis Association, 1944. 126 pp. Price, \$1.50.**

This second volume on tuberculosis in the United States, prepared under the direction of Carroll E. Palmer, is the result of a fruitful cooperative undertaking of the National Tuberculosis Association and the U. S. Public Health Service, utilizing most effectively basic data made available by the U. S. Bureau of the Census.

There is stated for each state, first,

in tabular form the percentages which tuberculosis deaths were to deaths from all causes by age, sex, and color during the 3 year periods 1939–1941, 1929–1931, and 1919–1921. Second, all of these data are separately and clearly charted. The salient aspects of tuberculosis in every part of the country are thereby effectively brought out, and the entire work is pregnant with practical indications as to where and among what groups health authorities and agencies may best concentrate anti-tuberculosis work.

Thus we see among whites that the percentage of tuberculosis deaths to deaths from all causes during the 3 year period 1939–1941 varied all the way from 1.8 in Utah to 12.7 in Arizona, and among non-whites from 3.4 in South Carolina to 10.0 in California. Likewise it was found for the entire United States that 14.2 per cent of all the deaths among white men in the important age group 30–34 were due to tuberculosis; among white young women 20–24 it rose to 22.9 per cent. Further, among colored men 20–24, the percentage of tuberculosis deaths was 28.8 and, among colored girls 15–19, it was as high as 37.9.

The authors of this compendium have carefully pointed out that, while specific mortality rates are the most dependable measures, there is need during intercensal periods of a usable index of the trend and current changes in tuberculosis independent of population enumerations. And "the present volume is intended to provide a base-line for the study of changes in tuberculosis mortality by means of proportionate mortality."

During the 3 years 1939, 1940, and 1941, there were still recorded 181,385 deaths from tuberculosis in the United States and 307,956 new cases were registered. The present study by the U. S. Public Health Service and the National Tuberculosis Association is a

practical contribution in the daily fight against the disease.

The report is so well done on a state-wide level that it is to be hoped something similar might be done, with deaths corrected this time for residence and with information for Negroes separate from that for other non-whites, for the larger cities of the United States where tuberculosis prevails at much higher rates.

GODIAS J. DROLET

**Mass Radiography of the Chest—**

*By Herman E. Hilleboe, M.D., and Russell H. Morgan, M.D. Chicago: Year Book Publishers, 1945. 288 pp. Price, \$3.50.*

The development of equipment for the x-ray examination of large groups of individuals at a reasonable cost has provided public health workers and phthisiologists with the most practical means for the early diagnosis of tuberculosis since the original discovery of the x-ray. Although photofluorography of the chest has been practicable only a few years, the numbers of individuals x-rayed with this method has already reached into the millions, with every indication that when the production of this type of equipment for civilian use is resumed, even larger numbers will be reached.

This small volume covers all phases of mass x-ray surveys, from the preliminary planning, through the detailed routine to be followed during the actual survey, to the study and care of the persons found to have x-ray evidence of pulmonary disease. All types of equipment are discussed, including 35 mm, 70 mm, and 4 x 5 in. x-ray films as well as 14 x 17 in. sensitized paper. In the consideration of the relative merits of each of these media, the authors avoid the error too often made in the literature of over-enthusiasm regarding the relative accuracy of the small films. They recognize that these films have a

definite margin of error, particularly in the diagnosis of minimal tuberculous lesions, but point out that in spite of this, photofluorography is unexcelled in the x-ray examination of large numbers of individuals at low cost.

A large part of the book is devoted to a very lucid, somewhat detailed description of the various types of equipment and the factors involved in their choice and operation. The roentgen diagnosis of diseases of the chest is considered, with 48 full-page reproductions of x-ray films to illustrate some of the types of pulmonary pathology found.

The subject matter is presented clearly and the book should serve as an excellent reference work for public health workers interested in mass chest x-ray surveys, particularly for those with some technical training or interest.

ROBERT E. PLUNKETT

**Microbial Antagonisms and Antibiotic Substances—***By Selman A. Waksman. New York: The Commonwealth Fund, 1945. 350 pp. Price, \$3.75.*

The rapidly expanding literature on antibiotics has been greatly in need of an enlarged review to enable those not specializing in the field to keep abreast of the developments. The need is well met by this book. The author has made a very complete coverage of the literature and accumulated a bibliography of 1,016 references. His point of view, that of a soil microbiologist, is made quite apparent in the early chapters, where the fundamental background material of the subject is given. While it would be desirable for everyone concerned with the subject to be familiar with the material in this book, it is written for the research worker. The section dealing with the interests of the public health worker is a relatively small part. The author discusses the possibilities of further developments in the field.

The reviewer would recommend it as an excellent book for the reference shelf.

G. A. LEPAGE

*Higiene y Salud Publica—By Charles Frederick Bolduan, M.D., and Nils William Bolduan, M.D. (3rd ed. rev.) Translated by Clare H. de Kirk. Bogota, Colombia: Editorial Antena, 1943. 268 pp.*

This is a translation of the third revised edition (1941) of the Bolduans' *Public Health and Hygiene*. It enters a field as yet barely touched, that of texts in Spanish on public health, and should be a valuable contribution. It is a pity that wartime shortages did not permit the volume to appear in as good a printing as its English counterpart. The binding and the paper are such that the photographs and some of the cuts could not be reproduced. Particularly to be lamented is the plate of the course of eruption in vaccination, and the plate of the malarial parasites.

Since the English text was written in 1941, there is naturally an omission of the more recent developments, such as: gamma globulin in measles control, and penicillin for syphilis and gonorrhea. The statement that tuberculosis case finding among adolescent children "should usually consist of two steps, namely, a proper Mantoux test and subsequently an x-ray examination of the positive reactors" might be challenged now by proponents of the inexpensive miniature films.

The volume presents clearly in simple form without detail, public health practice in the United States and as such should be of value to college students and nurses, though it will need to be supplemented by a consideration of local conditions. The Spanish text is not colloquial and on occasion shows the effect of literal translation. It is written in a much more direct style than original Spanish would be, but is always understandable. There still

exists a great need in Latin America for a comprehensive reference book on public health in Spanish that deals with the problems found in those countries and that considers administrative practices and available facilities there.

The Bolduans are to be congratulated on having made their volume available to our Spanish speaking neighbors and it is to be hoped that it may serve as a stimulus to develop what is truly needed.

JEROME S. PETERSON

*Nursing in Prevention and Control of Tuberculosis—By H. W. Hetherington, M.D., and Fannie Eshleman, R.N. (rev. ed.) New York: Putnam, 1945. 332 pp. Illus. Price, \$3.00.*

The revised edition of this universally known and used book is welcome. Miss Eshleman has again included her presentation of nursing care of the tuberculous patient in home, hospital, and clinic, and the chapters on collapse therapy and the prevention of tuberculosis among nurses which are so frequently quoted. Fresh material on rehabilitation and a new case history have been added.

However, one looks in vain for recent references to the effect of war on tuberculosis and nursing policies, to the use of chemotherapy, new theories as to rest, and developments in governmental interest in the control of this disease. There is a dearth of references to publications and developments in the field as a whole since 1941. A reëdition of the earlier book would be a better description of it than to call this book a revision. Nevertheless, it is still one of the best presentations we have of nursing in tuberculosis.

DOROTHY DEMING

*Physical Growth from Birth to Two Years: I. Stature. A Review and Synthesis of North American Research for the Period 1850-1941—By*

Howard V. Meredith, Ph.D. *Iowa: University of Iowa Press, 1943. 337 pp. Price: Cloth bound, \$1.75; Paper bound, \$1.50.*

Data on growth appear in so wide a range of surveys and investigations that those interested in the field will welcome the review presented in this monograph. It is divided into two parts, of which the first is an attempt to synthesize material in the literature. The author emphasizes that "the scope of the study is restricted anthropometrically to stature, chronologically to the first two postnatal years, geographically to North American research and secularly to investigations reported before 1942." Within these limitations the data available are examined with regard to secular differences, race, sex, geographic location, socio-economic status, parity, age, and stature of mother, prematurity, disease and diet.

Among the conclusions apparently justified from the literature is the upward secular trend in the past 50 years. The gain in stature is slight at birth, of the order of 0.5 cm., but amounts to as much as 4 cm. at 1 to 2 years. Analysis of racial differences inevitably brings up the question of the relative influences of genetic and environmental factors. At birth, white infants appear to exceed Negro infants by "roughly half an inch," yet when the two groups are given like diets, the Negro is no shorter than the white at age 2 years.

The author is very cautious about drawing conclusions from the data related to socio-economic differences in view of the difficulty in defining criteria for different levels and evaluating the influence of medical guidance and supervision. The closely related question of diet is analyzed only postnatally and from the limited questions of influence of human versus cow's milk (no apparent difference), vitamin D supplement (some differences), and vitamin B complex and mineral supplement (no

apparent difference). Recent work of Tisdall and Ebbs in Toronto, and Burke and Stuart in Boston, indicates that differences do exist at birth related to the maternal diet prenatally, and diet is obviously influenced by "socio-economic status."

The second part of the monograph consists of an annotated bibliography of 130 papers published prior to 1942.

The author's efforts have been detailed and painstaking, and the monograph should prove invaluable to research workers and to all those concerned with the care and supervision of infants. It is unfortunate that its usefulness for the average physician and nurse engaged in child hygiene will be impaired by the profusion of unnecessarily complicated statistical terms. A sentence like—"In each instance the significance ratio was found to exceed the critical value required for confident rejection of the null hypothesis at the 1 per cent level" succeeds merely in burying a relatively simple fact in a mass of words, unintelligible to anyone without considerable training in theoretical statistics. This shortcoming should not, however, deter interested persons from reading and using this monograph. MYRON E. WEGMAN

**Occupational Accident Prevention**  
—By Harry H. Judson and James M. Brown. *New York: Wiley, 1944. 234 pp. Price, \$2.75.*

This book, which is addressed primarily to members of the supervisory staffs of industrial organizations, contains a non-technical presentation of the more important factors which have proved effective in the control of occupational accidents. It is based upon notes originally developed by the authors for their use in conducting courses in industrial safety engineering under the Engineering Science and Management War Training Programs. The book emphasizes the necessity for

management leadership in industrial safety programs and stresses the fact that effective accident prevention results in increased production, decreased production costs, and the elimination of production interruptions.

The various factors discussed by the authors are classified in three major groups, namely: "The Improvement of Work Procedures," "The Improvement of the Plant," and "Safety Activities." Under these headings the material is presented as a guide to supervisors in recognizing the various accident problems of industry and in exercising effective leadership in the control of these problems.

In the first group, the authors discuss methods of preventing falls and accidents incident to handling materials, and the use of hand tools. They also emphasize the importance of plant housekeeping, plant maintenance, per-

sonal protective equipment, and programs to train and maintain the interest of employees.

In the second group, the authors discuss the need of determining accident causes and of investigating current accidents, and outline methods of improving plant conditions through proper layout, illumination, mechanical guarding, removal of electrical hazards, fire prevention and fire extinguishing.

In the third group, the discussion of safety activities starts with a brief outline of the purposes of compensation laws. Among the activities which have proved effective in reaching the employees with the safety message, the authors discuss safety organization, plant inspection, first aid facilities and instruction. Reference is also made to accident standards and codes, and to the selection and purchase of safety equipment. W. GRAHAM COLE

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.*

AMERICAN EDUCATION IN THE POSTWAR PERIOD. Part I—Curriculum Reconstruction. 44th Yearbook. National Society for the Study of Education. Chicago: University of Chicago Press, 1945. 297 pp. Price, cloth \$3.00, paper \$2.25.

AN INDEX OF DIFFERENTIAL DIAGNOSIS OF MAIN SYMPTOMS. By various writers, edited by Herbert French, C.V.O., C.B.E., M.A., M.D. Oxon, F.R.C.P. 6th ed. Baltimore: Williams & Wilkins, 1945. 1128 pp. Illus. Price, \$17.00.

ANIMAL COLONY MAINTENANCE. By Edmond J. Farris, F. G. Carnochan, C. N. W. Cumming, Sidney Farber, Carl G. Hartman, Frederick B. Hutt, J. K. Loosli, Clarence A. Mills and Herbert L. Ratcliffe. New York: New York Academy of Sciences, 1945. 126 pp. Price, \$1.50.

THE BACTERIAL CELL. In Its Relation to

Problems of Virulence, Immunity and Chemotherapy. By René J. Dubos. Cambridge: Harvard University Press, 1945. 460 pp. Price, \$5.00.

BETTER TEACHING THROUGH TESTING. A Practical Manual for the Physical Education Teacher. By M. Gladys Scott, Ph.D., and Esther French, Ph.D. New York: Barnes, 1945. 247 pp. Price, \$2.50.

THE CHEMICAL FORMULARY. A Collection of Valuable, Timely, Practical Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry. Vol. VII. Editor-in-chief, H. Bennett. New York: Chemical Publishing Co., 1945. 474 pp. Price, \$6.00.

CINCHONA IN JAVA. The Story of Quinine. By Norman Taylor. New York: Greenberg Publishers, 1945. 87 pp. Price, \$2.50.

- COMMON AILMENTS OF MAN. Edited by Morris Fishbein, M.D. Garden City: Garden City Publishing Co., 1945. 177 pp. Price, \$1.00.
- CONSERVING THE HEALTH OF COLORADO'S CHILDREN. A Handbook for Teachers. Denver: Department of Education and Division of Public Health, 1944. 247 pp. Price, \$1.00.
- THE DENTIST AND HIS PATIENT. Correlating Diagnosis and Treatment Planning with Patient Education and Practice Management for Optimum Control of Dental Disease. By David Friend, George D. Kudler, D.D.S., Myron M. Lieb, D.D.S., Robert Ritt, D.D.S., and Arthur A. Friend, D.D.S. New York: Revere Publishing Co., 1945. 480 pp. Price, \$10.00.
- DISINFECTION AND STERILIZATION. By Ernest C. McCulloch, D.V.M. 2nd ed. Philadelphia: Lea & Febiger, 1945. 472 pp. Illus. Price, \$6.50.
- ESSENTIALS OF HISTOLOGY. By Margaret M. Hoskins, Ph.D., and Gerrit Bevelander, Ph.D. St. Louis: Mosby, 1945. 240 pp. 135 illus. Price, \$3.50.
- FLUORINE IN DENTAL PUBLIC HEALTH. A Symposium. By Frederick S. McKay, D.D.S., H. Trendley Dean, D.D.S., Wallace D. Armstrong, Ph.D., M.D., Basil G. Bibby, Ph.D., M.D., and David B. Ast, D.D.S. New York: New York Institute of Clinical Oral Pathology, 1945. 62 pp. Free from publisher.
- GUIDE TO GUIDANCE. Vol. VII. A Selected Bibliography of 1944 Publications of Interest to Deans, Counselors, Advisers, Teachers, and Administrators. Edited by M. Eunice Hilton, Ph.D. Syracuse: Syracuse University Press, 1945. 62 pp. Price, \$1.00.
- HANDBOOK OF PRACTICAL BACTERIOLOGY. A Guide to Bacteriological Laboratory Work. By T. J. Mackie, M.D., and J. E. McCartney, M.D. 7th ed. Baltimore: Williams & Wilkins, 1945. 720 pp. Price, \$5.00.
- MARRIAGE AND FAMILY COUNSELING. A Manual for Ministers, Doctors, Lawyers, Teachers, Social Workers, and Others Engaged in Counseling Service. By Sidney E. Goldstein. New York: McGraw-Hill, 1945. 457 pp. Price, \$3.50.
- MEDICAL NURSING. By Amy Frances Brown, R.N. Philadelphia: Saunders, 1945. 579 pp. 153 illus. Price, \$2.75.
- MEN UNDER STRESS. By Roy R. Grinker, Lt. Col., M.C., and John P. Spiegel, Major, M.C. Philadelphia: Blakiston, 1945. 484 pp. Price, \$5.00.
- PROFESSIONAL NURSES. THE OUTLOOK FOR WOMEN IN OCCUPATIONS IN THE MEDICAL SERVICES. Bulletin 203, No. 3. Washington, D. C.: Women's Bureau, U. S. Department of Labor, 1945. 61 pp.
- REPORT OF THE SANITATION SERVICES OF THE BUREAU OF LABORATORIES FOR 1943. Hartford: Connecticut State Department of Health. 24 pp. Free from publisher.
- STOOL AND URINE CULTURES FOR ENTERIC DISEASE ORGANISMS. Bureau of Laboratories Approved Method EN-1. Hartford: Connecticut State Department of Health, 1945. 34 pp. Free from publisher.
- A SECOND LIST OF PUBLICATIONS ON DDT. By R. C. Roark. Washington, D. C.: Department of Agriculture, 1945. Pub. No. E-660. 27 pp. Free from publisher.
- SELECTED BIBLIOGRAPHY ON MEDICAL ECONOMICS. By Helen Hollingsworth and Margaret C. Klem. Bureau Memo. No. 60. Washington, D. C.: Social Security Board, Bureau of Research and Statistics, 1944. 21 pp. Free from publisher.
- STATISTICS OF MEDICAL SOCIAL CASEWORK IN NEW YORK CITY, 1944. By Ralph G. Hurlin. New York: Russell Sage Foundation, 1945. 21 pp. Price, \$.25.
- SYLLABUS OF AUDIOMETRIC PROCEDURES IN THE ADMINISTRATION OF A PROGRAM FOR THE CONSERVATION OF HEARING OF SCHOOL CHILDREN. Supplement to the Transactions of the American Academy of Ophthalmology and Otolaryngology. Edited by Horace Newhart, M.D., and Scott N. Reger, Ph.D. Rochester, Minn.: American Academy of Ophthalmology and Otolaryngology, 1945. 28 pp. Price, \$.25.
- TEXTBOOKS OF HEALTHFUL LIVING. By Harold S. Diehl, M.D. 3rd ed. New York: McGraw-Hill, 1945. 707 pp. Price, \$2.50.
- SCIENCE YEAR BOOK OF 1945. Edited by John D. Ratcliff. Garden City: Doubleday, Doran, 1945. 224 pp. Price, \$2.50.
- TUBERCULOSIS IN THE UNITED STATES. Graphic Presentation. Vol. 2. Proportionate Mortality Statistics for States and Geographic Divisions by Age, Sex and Race. Prepared by the staffs of the Division of Public Health Methods and the Tuberculosis Control Division, U. S. Public Health Service under the direction of Carroll E. Palmer, M.D. New York: National Tuberculosis Association, 1944. 126 pp. Price, \$1.50.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Speaking of Lohengrin**—Prospects of marriage are the same for the bachelor of 30, the widower of 40, and the male divorcee of 45—and they are 2 in 3. The spinster of 30, the widow of 33, and the divorcee of 45 all have a 1 in 2 chance of marrying. These are but two of several eye-opening findings that should furnish you a half hour of amused or bemused reflection if you are given to speculating on the ways of a man with a maid.

ANON. The Chances of Remarriage for the Widowed and Divorced. *Stat. Bull. (Met. Life Ins. Co.)*. 26, 5:1 (May), 1945.

**"Trichiknosis Is a Form of Diarrhea"**—So said the teacher. Boston's soiled school health educational linen is washed in public by the Strayer Committee, because other cities, too, could do with a little laundering.

ANON. Standards for a School Health Program. *J. School Health*. 15, 6:131 (June), 1945.

**An Iconoclast on the Loose**—This one is a must! A pediatrician takes apart a lot of accepted medical practices in his field, and gives you a close-up of the worn-out machinery. The hospital, he says, facilitates the work of the obstetrician but hampers that of the pediatrician. Then, here is another sample: "As between the chef and the dietitian, I choose the chef without reservation." Maybe you had better reserve your comment until you have read the paper which is loaded with eyebrow-raisers. Pray that someone equally gifted will do as thorough a job of veterinary surgery on our sacred cows of public health. And pardon the jumbled metaphors.

BAKWIN, H. *Pseudodoxia Pediatrica*. *New England J. Med.* 232, 24:692 (June 14), 1945.

**Health in Collective Bargaining**—Management has developed health and safety rules usually without consulting workers. Sometimes workers have used their union strength to oppose measures that would benefit them. Conditions are better nowadays even though there are still many companies and many unions whose activities show no evidence of consideration for the health needs of the worker. Into this noose the health official is invited to stick his innocent neck.

BLOOMFIELD, J. J. Labor-Management Relations in Industrial Health. *J.A.M.A.* 128, 9:639 (June 30), 1945.

**Do Health Examinations Promote Industrial Efficiency?**—One Hundred male industrial employees who have submitted to physical examinations over a fourteen year period were compared with a hundred who hadn't. It seems a shame to spoil this story by culling out the conclusions of this experience, so it shall be said here only that the findings do not entirely prove what you hope they would. The whole story should be read, for it is a good one.

BRISTOL, L. D. Value of Health Examinations in Industry. *J.A.M.A.* 128, 9:627 (June 30), 1945.

**From Aristotle to ECG**—Reviewing the history of man's accumulation of knowledge about the heart, the author of this scholarly paper concludes that the remaining problems center upon finding ways to sustain the performance of the heart muscle and to



maintain the health of the blood vessels through which nourishment is conveyed to it.

COHN, A. E. *Disease of the Heart*. Science. 101, 2628:471 (May 11), 1945.

**Distribution of Polio in 1944**—Higher than in any year since 1916, poliomyelitis struck down 19,053 Americans in 1944. (Indications are that the disease is going stronger this year than last.) This statistical study of last year's performance will prove useful for those who must face the coming epidemic.

DAUER, C. C. Incidence of Poliomyelitis in the United States in 1944. *Pub. Health Rep.* 60, 23:633 (June 8), 1945.

**Forty Million Still Lack Health Services**—Three essentials to permanent public health improvement are these: local health units for about 1,200 areas of jurisdiction; existing state jurisdiction and functions; federal services under a single directing head, and engaging in local activities only at the invitation of the state.

EMERSON, H. Larger Units of Local Health Jurisdictions Indispensable for National Health. *South. M. J.* 38, 4:276 (Apr.), 1945.

**Individual and Community Immunity**—Out of Halifax's tragic experience with virulent diphtheria come some lessons for us in luckier communities. One is that in the face of such an epidemic, it would be the part of wisdom to give all children a reinforcing dose of toxoid. Another is that health propagandists should be honest in their statements about protection afforded.

GIBBARD, J., *et al.* Some Observations on Diphtheria in the Immunized. *Canad. Pub. Health J.* 36, 5:188 (May), 1945.

**Skin Tests**—Probably the "Medical Progress" series of papers should be

mentioned less frequently in this bibliography, for they are merely reviews. But this one, which collects and solidifies the latest scientific information on the skin tests for brucellosis, chancroid, and the whole alphabet of infectious diseases seems to be of especial interest to health workers.

KANE, L. W. *Skin Tests in Bacterial and Viral Diseases*. *New England J. Med.* 232, 25:728 (June 21), 1945.

**Syphilis Epidemic**—Though it is still true that epidemiologic investigations of syphilis cases may be productive, many health officials find it hard to credit the evidence. So this study of 25 named contacts of one lady of easy virtue should be brought to your attention if you are a Doubting Thomas, too.

MATTISON, B. F., and EARLE, H. H. An Outbreak of Early Syphilis in Western New York State. *New York State J. Med.* 45, 10:1105 (May 15), 1945.

**Made in Detroit**—You will find much of interest in this description of a field-and-hospital coordination program by which health department nurses carry out the group instruction and individual guidance for maternity, tuberculosis, and communicable disease patients in the hospital.

RYER, I. It Takes Imagination and Courage. *Pub. Health Nurs.* 37, 5:252 (May), 1945.

**Sign of the Times**—You will be interested to learn that 15 little girls were cured of gonorrheal vaginitis with one dose of penicillin. The sixteenth child required additional divided doses. Hospitalization is unnecessary—a far cry from the earlier day's regimen.

SAKO, W., *et al.* One Dose Penicillin Treatment of Chronic Gonorrheal Vaginitis in Children. *J.A.M.A.* 128, 7:508 (June 16), 1945.

## ASSOCIATION NEWS

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### *Health Officers Section*

F. Kenneth Albrecht, M.D., State Health Dept., Jefferson City, Mo., Director of Tuberculosis Control Division  
David E. Price, M.D., M.P.H., 615 N. Wolfe, Baltimore 5, Md., Senior Asst. Surgeon, U. S. Public Health Service  
Arthur V. Turner, Dept. of Health, Lyndhurst, N. J., Health Officer and Registrar of Vital Statistics

#### *Laboratory Section*

Emiliano Armijo, M.D., Andres Bello 80, Santiago, Chile, S. A., Prof. of Bacteriology, Escuela de Salubridad, Universidad de Chile  
Pvt. Gino A. Curreri, Medical Laboratory Technician, General Hospital  
August Holm, Sc.D., E. R. Squibb & Sons, New Brunswick, N. J., Bacteriologist  
Joseph C. McCaffrey, M.P.H., 611 Lakeview Terr., Glen Ellyn, Ill., Bacteriologist IV, State Dept. of Public Health  
Paulo Mello-Freire, M.D., Caixa Postal 26, Mogi das Cruzes, Estado de Sao Paulo, Brazil, S. A., Student, Yale Univ., New Haven, Conn.  
Katherine Parrotta, Bradford Hospital, Bradford, Pa., Chief Laboratory Technician

#### *Vital Statistics Section*

William H. Alban, 1008 City Hall, Houston, Tex., Registrar and Statistician, Houston City Health Dept.  
Manuel A. Gonzalez, Box 245, Hato Rey, P. R., Chief of Statistics, Insular Police  
Ethel Henshaw, Dade County Courthouse, Room 816, Miami, Fla., Director, Bureau of Vital Statistics, Dade County Health Dept.  
Bronson Price, Ph.D., 4854 MacArthur Blvd., N.W., Washington 7, D. C., Vital Statistics Division, Census Bureau

#### *Engineering Section*

Eugene E. Atwood, USN Medical Research Unit No. 1, Berkeley, Calif., Sanitary Officer and Pharmacist

Jorge L. Colon, Jose I. Quinton, Coamo, P. R., Trainee for Sanitation Official, Dept. of Health

Sergio Cuevas, Box 2832, San Juan, P. R., Administrator and Chief Engineer, Aqueduct and Sewerage Service

Joseph L. Dermody, 2000 Massachusetts Ave., N.W., Washington, D. C., P.A. Engineer (R), U. S. Public Health Service

Milton E. Held, State Dept. of Health, Des Moines 19, Ia., Senior Milk Sanitarian

Louis R. Howson, C.E., 20 N. Wacker Drive, Chicago, Ill., Sanitary Engineer, Alvord, Burdick & Howson

Jens A. Jensen, Box 950, Goldsboro, N. C., P.A. Engineer (R), U. S. Public Health Service

Ramon E. Perez-Baerga, 39 Intendente Ramirez, Ponce, P. R., Sanitarian, Insular Dept. of Health

Eduardo Reyes-Segarra, 4 Machin St., Santurce, P. R., Sanitary District Engineer, Public Health Dept.

Jose A. Seraballs-Medel, Ave. Fernandez Juncos No. 43 altos, Santurce, P. R., Trainee, Insular Health Dept.

Enrique S. Vilella, Los Angeles No. 17, Ocean Park, Santurce, P. R., Health Official Trainee, Insular Dept. of Health

#### *Industrial Hygiene Section*

Allen N. Koplin, M.D., Rest Haven Motel, Box 941, Yakima, Wash., Clinic Medical Officer, War Food Administration

#### *Food and Nutrition Section*

Cleveland W. Duncan, Deerfield Packing Corp., Bridgeton, N. J., Supervisor of Farm Workers

Marguerite M. Krebs, 806 UB Bldg., Dayton T. O., Director, Dairy Council

Johan M. Latsky, Ph.D., Union Health Dept., Box 386, Pretoria, South Africa, Chief Nutrition Officer, Dept. of Public Health, Union of South Africa

Lillian L. Nash, M.D., 4715 N. Spaulding Ave., Chicago 25, Ill., Nutritionist, Cook County Public Health Unit

*Maternal and Child Health Section*

Ramon Aguiar-Nicto, M.D., Puente Restaurador, Avenida Miranda Letra H., Caracas, Venezuela, S. A., Medical Chief, Public Health Unit

Eleanor M. Murphy, Box 906, Dickinson, N. D., District Child Welfare Worker and Juvenile Commissioner, Public Welfare Board, Bismarck.

Julia Torres-Rodrigues, Dr. Veve No. 9, Bayamon, P. R., Senior Social Worker, Bayamon District Hospital, Dept. of Health

*Public Health Education Section*

Sanford Bates, State Office Bldg., Trenton, N. J., Commissioner, State Dept. of Institutions and Agencies

Elizabeth V. Cunningham, 45 Rockefeller Plaza, Room 3870, New York 20, N. Y., Asst. Director in charge of Health and Medical Films, American Film Center

Philo T. Farnsworth, Ph.D., 852 S. 6th E., Salt Lake City 2, Utah, Asst. Superintendent, Salt Lake County General Hospital

Ruth M. Harris, 615 E. 4th St., Charlotte, N. C., Exec. Secy., Mecklenburg County Tuberculosis Assn.

Thomas A. Hart, Ph.D., 2611 Lee Blvd., Apt. 202, Arlington, Va., Chief, Malaria Control Branch, Tropical Disease Control Division, Preventive Medicine Service, Surgeon General's Office

Noreen H. Heath, 3 Bermuda House, Reid St., Hamilton, Bermuda, School Nurse and Inspector of Midwives, Dept. of Public Health

Amanda E. Hendrickson, M.A., Box 264, Dickinson, N. D., Instructor, State Teachers College

Hiram A. Jones, Ph.D., State Education Bldg., Albany, N. Y., Administrative Director of Health and Physical Education, State Education Dept.

Anne G. Moore, R.N., 1551 Franklin Ave., Mineola, N. Y., Consultant Nurse, Nassau County Cancer Committee

Gracia Nadal-Grau, M.S., Betances No. 23, Aguadilla, P. R., Supervisor of Medical Social Workers, Dept. of Health

Eleanor Pearlman, 7602 Bay Parkway, Brooklyn, N. Y., Student, Yale Univ., Dept. of Public Health

Isabel Ramirez, 1000 E. Ann St., Ann Arbor, Mich., Student, Univ. of Michigan, School of Public Health

Mary B. Rappaport, R.N., M.A., State Education Dept., Albany 1, N. Y., Supervisor of Health Teaching

Albert N. Robinson, 103 Cherry St., Monroe, La., State Representative, The National Foundation for Infantile Paralysis

Ella J. Rose, Ph.D., University Farm, St. Paul 8, Minn., Home Economics Teacher

Eloy Santiago-Vega, Americo Salas No. 1, Stop 20, Santurce, P. R., Chief Counselor, Venereal Disease Hospital, Dept. of Health

Clement C. Swain, M.D., 129 N. Virginia St., Reno, Nev., Secy., Nevada Tuberculosis Assn.

*Public Health Nursing Section*

Lena Besendorfer, 115 S. State St., Salt Lake City 1, Utah, Public Health Nursing Supervisor, City Board of Health

Dorothy E. Clark, County Office Bldg., White Plains, N. Y., Instructor of Public Health Nursing, Westchester County Dept. of Health

Gertrude A. Koeneman, 213 W. Walnut, Harrisburgh, Ill., Supervising Nurse, Dist. No. 18, State Dept. of Public Health

Clio McLaughlin, R.N., State Board of Health, Jacksonville 1, Fla., State Tuberculosis Consultant

Martha R. Smith, M.A., R.N., 84 Exeter St., Boston, Mass., Prof. of Nursing Education, Boston Univ.

Asuncion Solis, R.N., San Rafael, Yabucoa, P. R., Public Health Nurse, Insular Dept. of Health

Flora R. Wakefield, Wake County Health Dept., Raleigh, N. C., Supervising Nurse

Robina Walters, Box 260, Dixon, Ill., District Supervising Nurse, Dist. 3, Dept. of Public Health

*Epidemiology Section*

Ahmed M. Kamal, Egyptian Public Health Assn., 8 Sheikh Hamzash, Cairo, Egypt, Director General, Dept. of Preventive Medicine

Dr. Pedro Rosado, Rua Manoel Barata No. 630, Para, Brazil, S. A., Medical Supervisor of Migration Program

Robert L. Smith, M.D., State Dept. of Health, Charleston, W. Va., Asst. Director, Bureau of Tuberculosis

Capt. Maxwell Stillerman, M.C., 3215 41st St., Long Island City, N. Y., Medical Officer, U. S. Army

Donald C. Tulloch, M.D., M.P.H., State Dept. of Health, Albany, N. Y., Asst. District State Health Officer

Antonio M. Vilches, M.D., M.P.H., Boyaca 33, Buenos Aires, Argentina, S. A., Epidemiologist, Virus Section, Instituto Bacteriologico

Allen E. Walker, M.D., Denver Rapid Treatment Center, Denver General Hospital, Denver, Colo., Medical Officer in charge

*School Health Section*

- Zeta E. Bankert, M.S., 231 Mumford Hall, Columbia, Mo., Instructor in Rural Sociology, Univ. of Missouri  
 Robert H. Brown, M.D., 665 Melish Ave., Cincinnati 29, O., Clinic Physician, Cincinnati Health Dept.  
 D. Lenora Kirk, 34 Lenape Rd., Colwick, Merchantville, N. J., School Nurse, Folcroft and Glenolden School Districts  
 Aria C. Rosner, R.N., 1666 Detroit St., Denver 6, Colo., School Nurse, Denver Public Schools  
 Vicente Roure, Jr., M.A., Bradway 51, Box 28, Hato Rey, P. R., Supervisor, Dept. of Education, San Juan  
 Lena M. Schermann, M.A., Bureau of Public Health Nursing, State Dept. of Health, Lansing, Mich., Regional Consultant

*Dental Health Section*

- C. J. Hollister, D.D.S., 217 State St., Harrisburg, Pa., Exec. Secy., State Dental Society

*Unaffiliated*

- Gisli Asmundson, 4645 Mississippi St., San Diego, Calif., Pharmacist, U. S. Navy  
 George H. Bradley, 605 Volunteer Bldg., Atlanta, Ga., Senior Entomologist (R), U. S. Public Health Service  
 Conchita Carrasquillo, Box 452, Caguas, P. R., Medical Social Work Supervisor, Bureau of Social Services, Dept. of Health  
 Gumersindo Cordero-Antunano, Ave. Guzman, Box 275, Humacao, P. R., Official Trainee, Insular Dept. of Health  
 John J. Essex, D.V.M., 831 Mercantile Bank Bldg., Dallas, Tex., Typhus Control Consultant and Sanitarian (R), U. S. Public Health Service  
 Paul J. Friedman, D.V.M., 242 Lexington Ave., Passaic, N. J., Veterinarian  
 Richard C. Gary, P. O. Box 1243, Pensacola, Fla., Pharmacist, U. S. Navy  
 Isabel Gordo, M.A., Medical Social Work Dept., District Hospital, Fajardo, P. R., Supervisor

- Harold J. Haley, 59 Grove, Leicester, Mass., Pharmacist, U. S. Navy  
 Jack F. Hensley, 316 Dixie Ann Ave., North Sacramento, Calif., Case Finding Director, Sacramento Tuberculosis Assn.  
 Ann L. McColley, 3333 Grand Ave., Des Moines, Ia., Physical Therapist, Iowa Lutheran Hospital  
 Samuel Morris, Ph.D., 41 Exchange Place, U. S. Public Health Service, Atlanta, Ga., Protozoologist in charge of Typhus Control for Puerto Rico and the Virgin Islands  
 Virgilio Negron, Monsenor Torres 1, Rio Piedras, P. R., Chief Health Inspector, Bureau of Public Health Unit  
 Jose L. Pillich-Bachillie, 71-11th St., Santurce, P. R., Health Official (Trainee), Puerto Rican Health Dept.  
 Rafael Pirazzi-Rexach, 54 Manila St., P. O. Box 396, Rio Piedras, P. R., Public Health Official (Trainee), Insular Dept. of Health  
 John J. Smith, 115 11th Ave., N.E., Minot, N. D., Pharmacist, U. S. Navy  
 Dennis F. Williamson, P. O. Box 532, St. Pauls, N. C., Sanitation Officer, U. S. Navy

## DECEASED MEMBERS

- George E. Bolling, Brockton, Mass., Elected Member 1900, Charter Fellow, and 40 year member, Laboratory Section  
 Ben W. Creel, D.V.M., Mobile, Ala., Elected Member 1940, Unaffiliated  
 Benjamin E. Holsendorf, Ph.D., St. George, Staten Island, N. Y., Elected Member 1944, Public Health Education Section  
 Lt. Peter J. Knaus, Sn.C., Service Overseas, Elected Member 1943, Laboratory Section  
 Frederick B. Miner, M.D., Flint, Mich., Elected Member 1940, Maternal and Child Health Section  
 Barbara S. Quin, New York, N. Y., Elected Member 1929, Unaffiliated  
 Randle C. Rosenberger, M.D., Philadelphia, Pa., Elected Member 1915, Charter Fellow, Laboratory Section

## DR. PALMER COMMISSIONED

George T. Palmer, Dr.P.H., Associate Field Director of the A.P.H.A., has been commissioned as Senior Sanitarian (Reserve) in the U. S. Public Health Service with the rank of Lt. Col., and assigned to the Division of Public Health Methods to be in charge of a

unit on Professional Education. He will serve as Executive Secretary for the Surgeon General's Committee on Post-War Training of Public Health Personnel. By the latter part of July, he will probably be located permanently in Washington, D. C.

## A.P.H.A. TO ACCREDIT SCHOOLS OF PUBLIC HEALTH

The Association's Committee on Professional Education, William P. Shepard, M.D., Chairman, with the approval of the Executive Board, is undertaking the accreditation of schools of public health. The initiative for this urgent project came originally from the Association of Schools of Public Health, in a resolution adopted on April 23, recommending that the A.P.H.A. "create a properly constituted accrediting body to carry forward progressively a list of universities qualified with regard to program, personnel, and facilities, to offer adequate courses leading to the degrees of Master of Public Health, Doctor of Public Health, and the Diploma in Public Health." This was followed closely by a similar request to the Association from the Surgeon General's Committee on Post-war Training. Funds have been made available by the Commonwealth Fund as of June 15 for a period of three years. A highly qualified counsellor will be responsible for the investigative work, and he will be aided by persons experienced in the administration of health departments, chosen from different localities for different schools.

An Advisory Committee of the As-

sociation of Schools of Public Health, under the Chairmanship of Harry S. Mustard, M.D., will work with the Committee on Professional Education.

The suggested procedure, subject to possible modification, contemplates that schools will be examined for accreditation at their own request, and that first attention will be given to schools in the United States now offering the M.P.H. and in Canada offering the Diploma. The development of criteria is already under way.

Accreditation of field training stations and of courses for various public health specialties will not be attempted immediately. Schools of sanitary or public health engineering will presumably continue to be accredited by the professional engineering group recently active in this field and the National Organization for Public Health Nursing will continue in the field of public health nursing programs of study.

The preliminary plans include early announcement that the Association is prepared to undertake accreditation of schools of public health, and publication of a list of accredited schools as soon as possible.

---

### WANTED: BACK ISSUES OF THE AMERICAN JOURNAL OF PUBLIC HEALTH

Again the Central Office is sending out an SOS for *Journals* that are out of stock and which are especially needed now to complete sets for the countries that have been occupied and which now are requesting help in rebuilding their technical libraries. The *Journals* that can be used for this purpose are listed below:

1941—January, April, July, August

1942—January, March

1943—January, March, August, September, October, November, December

1944—June, August

1945—January, February, March, April

Members who can return any of the above *Journals* to the A.P.H.A. are requested to do so collect.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

### POSITIONS AVAILABLE

(Supplemental to lists in recent Journals)

**Wanted:** Two engineers for Industrial Hygiene Service of Tennessee. Four different starting salaries between \$2,364 and \$3,900 depending on training and experience. Car furnished. Positions permanent. Opportunity for advancement. Apply Dr. R. H. Hutchinson, Commissioner of Health, Nashville 3, Tenn.

**Wanted:** Physician, Division of Child Hygiene, Ohio Dept. of Health. Salary \$4,200. Must be graduate of approved medical school, have 1 year's internship and at least 1 year graduate training, plus 1 year of training or experience in clinical pediatrics or obstetrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Dept. of Health, State Departments Bldg., Columbus 15, Ohio.

**Positions open:** District and County Health Officers in Florida. Medical degree required. Write or wire Merit System Supervisor, State Board of Health, Gainesville, Fla., for complete information.

**Physician wanted:** Public health pediatrics and epidemiology in large California County Health Department. Major duties consist of infant and pre-school health conferences, school examinations, and epidemiology. Beginning salary \$455 per month, plus travel allowance, and one meal a day. California license required. Training, experience in pediatrics or public health desirable. Immediately available. Apply William C. Buss, M.D., Kern Co. Health Dept., Bakersfield, Calif.

Bureau of Tuberculosis, Board of Health, Territory of Hawaii, seeks Biometrician or Statistician. Position will probably be classified under Territorial Civil Service as CAF-8 with salary of \$244.59 plus wartime bonus of \$50 and yearly increment of about \$192 up to

5 years. Bureau of Tuberculosis is also looking for young physician experienced in tuberculosis work to have immediate charge of active case finding survey program now under way. This position classified under Territorial Civil Service as P-5 with salary of \$416.67 plus \$50 wartime bonus and yearly increment of about \$250 up to 5 years. Apply Robert H. Marks, M.D., Director, Bureau of Tuberculosis, Territorial Board of Health, Honolulu, T.H.

**Wanted:** Bacteriologist with B.S. or M.S. degree, preferably male, to teach student nurses, 45 hour course twice a year, to assist with teaching of second year medical students and do general laboratory work. Salary \$2,000 with option of complete maintenance for \$25 per month. Apply Dr. R. J. Schenken, Director, Dept. of Pathology and Bacteriology, Louisiana State University School of Medicine, New Orleans 13, La.

**Wanted:** Physician to assume directorship, Bureau of Venereal Diseases, in eastern city of 185,000 population. Permanent position. Minimum salary \$4,657, maximum \$5,197.37, includes cost of living adjustment. Travel allowance. Apply Box J, Employment Service, A.P.H.A.

**Wanted:** City Health Services director for city health department in California, city of 100,000 population. Pediatrician or public health trained physician to administer program, serve as clinician in child health conferences and supervise nursery school health program. Salary up to \$6,300 per annum, plus travel. Send complete details and photograph to Box I, Employment Service, A.P.H.A.

Excellent opportunities, permanent tenure, for doctors, dentists, nurses, technicians with the Oregon State Board of Health in specialized fields. For information write Merit System Council, 616 Mead Bldg., Portland 4, Ore.

**Wanted:** Immediately: Veterinarian for Columbia County Department of Health. Salary—maximum \$3,600 per year plus automobile and up-keep. Veterinarian must be licensed in New York State. Address Dr. Sue H. Thompson, 612 Warren Street, Hudson, N. Y. Position for the duration of the war.

**Wanted:** Sanitarian and dairy inspector for field work. Salary \$2,400 per year plus \$5 per day for living expenses. Auto with gasoline and all other expenses furnished. Apply E. J. Ward, Commissioner of Agriculture, State Dept. of Agriculture, Cheyenne, Wyoming.

**Wanted:** Public health officer in well established health department in county of 68,000 population. Salary \$5,500. Apply Floyd O. Prunty, Chairman, Marion Co. Lay Health Committee, 300 Second St., Fairmont, W. Va.

**Executive Secretary Wanted.** Applicant must have some specialized training and experience in health education. Executive experience desirable. Salary \$3,000 up, depending upon qualifications. Car furnished. Apply with full information to A. C. Martin, M.D., Nassau Co. Cancer Committee, 1551 Franklin Ave., Mineola, N. Y.

**Wanted:** Experienced graduate bacteriologist. Take complete charge of local health department laboratory. Civil service protection, tenure and pension. Starting salary \$1,980 per annum. Apply Health Department, P. O. Box 786, Plainfield, N. J.

**Wanted:** A man well trained in bacteriology, Ph.D. preferred, with considerable chemical training; experience in field of surface-active agents, detergents, and foods desirable. Apply Frozen Food Foundation, Inc., P. O. Box 1332, Syracuse, N. Y.

City of Jackson, Mich., Civil Service Board will accept immediate applications for position of public health nurse in city health department. Must be graduate of high school and school of nursing of recognized standing with special training in public health nursing; registration in Michigan; some experience in public

health nursing, preferably with certificate in public health nursing and some knowledge of advanced public health and social service practice. Salary \$2,000 per year. Applications may be obtained from Civil Service Board, 4th Floor, City Hall, Jackson, Mich.

**Wanted:** General duty nurses, 48 hour week, \$125, full maintenance; also, anesthetist, 48 hour week, \$200, full maintenance. Apply T. J. Samson Community Hospital, Galsgow, Ky., Attention Director of Nurses.

**Wanted:** Public Health Nurses, Knoxville Area. Generalized nursing service in new and growing health department with unusual opportunities. Starting salary \$2,500 per year or higher, depending on qualifications. Opportunity for advancement. Apply Health Officer, Oak Ridge Dept. of Health, P. O. Box 486, Oak Ridge, Tenn.

**Wanted:** Experienced sanitarian for state dairy and restaurant inspection. Salary \$2,400 a year, plus \$5 per day expenses. Car furnished with gasoline and other expenses paid. Apply Dr. G. M. Anderson, State Board of Health, Capitol Building, Cheyenne, Wyo.

Two positions open in Sanitation Section, Div. of Health, City of St. Louis: Public Health Engineer II, salary \$210 to \$285 per month. Work consists of making surveys and studies of industrial plants, to determine nature and magnitude of industrial hygiene problems; making quantitative studies of plant environment, etc., checking protective equipment for effectiveness and make recommendations for further control measures. Study of ventilation, illumination, and sanitation of workroom. Desirable qualifications include graduation from recognized school of engineering and some experience or graduate training in industrial hygiene or public health engineering. Public Health Engineer I, salary range \$170 to \$220 per month. Engineering investigation of environmental problems and conditions, etc. Desirable qualifications include graduation from recognized school of engineering. No experience necessary. Applications may be made to Personnel Dept., Room 235, Municipal Courts Bldg., St. Louis 3, Mo.

#### POSITIONS WANTED

Health educator, Ph.D., Harvard, with training in medical science, public health and education, experienced as teacher, seeks position in Northeastern United States. H-512

Health educator, Master of Science in Public Health Education, with experience in visual aids, would like position with private agency in Southwest or Central West. H-514

# Opportunities Available

## Advertisement

**WANTED**—(a) Public health director; city-county program serving population of over half million; policies pertaining to departments controlled by university; teaching and research opportunities; \$7,500. (b) Physician to engage in public health, pediatrics, and epidemiology; major duties consist of infant and preschool health conferences, school examinations and epidemiology; county health department; headquarters in town of 80,000 located approximately midway between Los Angeles and San Francisco. (c) Woman physician to join staff of student health service; 4,000-4,500 students; one-third are women students; duties confined entirely to their care; South. (d) Public health physician to direct department of health, public school system; enrollment of 25,000; 800 employees; well staffed department; Middle West. (e) Physician for men's division of university health service and, also, two women physicians for women's division; Middle West. (f) Pediatric and obstetric consultants, state department of health; if not trained in public health, department will provide training; women eligible. **PH8-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Field director; state-wide health program; should be particularly well qualified public relations; Middle West. (b) Senior bacteriologist; duties consist of directing branch laboratory, performing difficult bacteriological, parasitological, and serological laboratory examinations; state department of health; Southwest. (c) Health educator; private agency; Chicago area. (d) Bacteriologist; public health laboratories; \$3,000, meals, Michigan. (e) Technologist trained in public health laboratory methods; state public health laboratories; town of 30,000; Rocky Mountain area. (f) Health director; state tuberculosis association; Middle West. (g) Assistant pro-

fessor, department of bacteriology and public health, state college; Pacific Coast. **PH8-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Public health nurse to direct program; duties consist of complete charge of various activities including home nursing, nurses aide and nurse recruitment; large city; southern California. (b) Assistant supervisor of nurses and, also, several staff nurses; public health organization, inaugurated two years ago; generalized program; growing organization; excellent opportunity for advancement; South. (c) Supervising nurse; county health department, well equipped department, staff of 12, progressive program having support of entire community; town of 30,000; Southeast. (d) Several public health nurses; Central and South America. (e) Orthopedic public health nurse; in addition to training in public health nursing, should have completed course in orthopedic nursing or physical therapy; \$3,240 including liberal travel allowance; Middle West. (f) Public health nurse to direct clinic, member of Community Chest and operated by private hospital; approximately 100 patients daily, cancer clinic in connection; California. (g) Several staff nurses for city-county department of health; generalized program; will consider registered nurses without training; salary during period of training \$150; salary for those trained or experienced in public health dependent upon qualifications but ranging from \$170 to \$220; town of 20,000, Pacific Northwest. (h) Public health nurse to give supervisory and consultant nursing services in the various specialties; state department of health; salaries dependent upon qualifications, minimum \$3,000. **PH8-3** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

# Situations Wanted

## Advertisement

Public health nurse is available for executive position; B.S. degree Columbia; three years, supervising nurse, state department of health; five years, field supervisor, large industrial company; four years, educational director, public health department, college of nursing. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist, graduate of the dental department of one of the leading universities, is available; twelve years' successful private practice, during which time he has held important faculty appointment; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; A.B., M.S., Ph.D. degrees; eight years' teaching experience; six years, director, department health education, large industrial company; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health physician; bachelor of arts degree, Eastern college; medical degree, Middle Western medical school; Master's degree in Public Health, Johns Hopkins; twelve years' experience as professor of preventive medicine, public health and industrial medicine, university medical school; has made valuable contributions to medical literature; recognized as a leader in field of industrial hygiene; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Malariaologist; B.S. in Biology; M.S. in Protozoölogy; Ph.D. in Bacteriology and Parasitology; two years, instructor and professor of biology, small college; while engaged in graduate work served as assistant in department of bacteriology and parasitology; expects early discharge from Army after three years with Sanitary Corps where work has been principally in malaria survey and control; has distinguished himself in the field of research. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.



## NEWS FROM THE FIELD

### RED CROSS POLICY COVERING CIVILIAN BLOOD DONOR SERVICES

G. Foard McGinnes, M.D., National Medical Director, American Red Cross, Washington, D. C., has released a statement of a new policy of the Red Cross regarding participation in civilian blood donor programs. Medical and health agencies which now have or are planning a program to furnish blood and blood derivatives for civilian use and are interested in obtaining the assistance of the Red Cross chapters should make contact with their chapter, if the territory the program is to serve is within an individual chapter's jurisdiction, or the appropriate area office of the American National Red Cross if the program is to serve a territory involving the jurisdiction of more than one chapter.

Authorization will be granted to Red Cross chapters to participate in civilian blood donor services only in case the chapter and the sponsoring agency meet the terms and conditions stipulated by the American National Red Cross. This requirement is in the interest of giving to the civilian population the benefit of the intensive experience gained by the American National Red Cross and the agencies associated with it in the operation of its blood donor service for the armed forces. It will also encourage the establishment, on a nation-wide basis, of proper standards of donor procurement and enrollment and of blood procurement and processing. The continuance of the American Red Cross in the field of blood donor service should inspire public confidence and stimulate a more ready response on the part of volunteer blood donors. This should facilitate the widest possible distribution of the products of

blood donor services to those who need them.

### NATIONAL ADVISORY CANCER COUNCIL RELEASE

Nine grants-in-aid totaling \$79,377 were approved at the twenty-eighth meeting of the National Advisory Cancer Council held in June at the National Cancer Institute of the U. S. Public Health Service, Bethesda, Md.

These funds, the greatest amount ever granted at one time by the Council, reflect the growing interest in the disease by medical groups throughout the country who are joining hands in cancer research and education. At the present time cancer is the second cause of death in the nation.

The largest individual grant, \$24,500, was made to Harvard University, Boston, Mass., for the study of the relation of steroid hormones to growth and tumors. Dr. J. H. Means will be in charge of this work. Drs. Fuller Albright and Joseph C. Aub will also participate in these studies.

Mt. Sinai Hospital, New York, was next on the list of approved grantees with a request of \$10,775 for clinical studies on gastric cancer. This work will be under the direction of Dr. Franklin Hollander.

Harvard University was given an additional grant of \$10,000 for study of the pathology of cancer of the stomach, peptic ulcer, and gastritis, with Dr. Shields Warren in charge.

Another grant was voted for clinical studies of gastric cancer which will be conducted by Dr. Leon Schiff of the University of Cincinnati, Cincinnati, Ohio. The school was granted \$10,000 for this purpose.

Approval was also given to North-

western University's, Chicago, request for \$8,500 for research in cancer education. Dr. A. C. Ivy, member of the Council, will supervise the work.

Dr. Paul A. Zahl will direct research on the virus-like agent in mammary cancer of mice for which the Haskins Laboratories, New York, was granted \$5,000.

The relation of certain types of diets to induced cancer in rats is the research planned by the Detroit Institute of Cancer Research, Detroit, Mich. A grant of \$6,152 was recommended for the study. Dr. W. F. Dunning will be in charge.

New York University, New York, was granted \$3,500 which will be used by Dr. Robert W. Chambers in a study of Hodgkin's disease.

A grant of \$1,450 was made to the University of Minnesota, Minneapolis, Minn., where studies on leukemia in mice will be conducted by Dr. Arthur Kirschbaum.

Members of the Council are:

Dr. George M. Smith, Executive Director of Council, and Professor of Anatomy of Yale University, New Haven, Conn.

Dr. Frank E. Adair, President of the American Cancer Society, Inc., and a staff member of Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York

Dr. A. C. Ivy, Professor of Physiology, Northwestern University Medical School

Dr. James B. Murphy, Rockefeller Institute for Medical Research, New York

Dr. A. Baird Hastings, Harvard University Medical School, Boston, Mass.

Dr. Sherwood Moore, Director of the Mallinckrodt Institute of Radiology, St. Louis, Mo.

Surgeon General Parran, Chairman, *ex officio* of the Council

The Public Health Service was represented by Dr. R. E. Dyer, Director of the National Institute of Health, Dr. R. R. Spencer, Director of the National Cancer Institute and Dr. Ralph Braund, Director of the Tumor Clinic, U. S. Marine Hospital, Baltimore, Md.

#### FOOD INFECTION OUTBREAK DUE TO CHEESE

About March 26, a number of residents of St. Francisville, Ill., became ill with symptoms of diarrhea, nausea, vomiting and fever. The cases rapidly increased in number until about 100 individuals were known to be affected.

Lawrence County, where St. Francisville is located, had been the first county in Illinois to take advantage of the Searcy-Clabaugh Act permitting the establishment of county health departments, and as a result had the services of specially trained public health personnel available to control situations such as had developed. With the cooperation of the attending physician, Dr. L. W. Frame, Health Officer of Lawrence County, immediately began an investigation which soon revealed that practically all of the persons involved in the outbreak had eaten long horn cheese which had been purchased from two local stores. In families where not all members had eaten of the cheese, it was noted that only those who had done so became ill.

The cheese from both stores was found to have been of the same lot and to have been obtained from the same distributor in a nearby town in Indiana. The further sale of the suspected cheese was stopped and the State Department of Public Health was notified. With the assistance and cooperation of the distributor the epidemiologic trail was pursued and the cheese was traced back to East St. Louis and then to a cheese manufacturing plant in northern Illinois. Shipments of this particular lot of cheese had been made to various places and it was soon learned that an outbreak similar to the one in St. Francisville had occurred in Dyersburg, Tenn., and the same cheese was suspected of being the cause. All of the cheese that could be located was withdrawn from the market by the distributor. Bacteriological studies are

being made in an attempt to learn exactly what organism was responsible for this outbreak.

An inspection of the creamery revealed the contaminated cheese had been made only 3 days prior to being shipped to the distributor, and only two weeks before consumption in St. Francisville. Of greater public health significance was the fact that, although the milk used had been put through a heating process, sanitary conditions in the plant were such that ample opportunity existed for contamination of the finished product. To prevent further outbreaks of this kind, the strictest possible sanitary practices are necessary in food handling establishments and no food handler should be permitted to work while suffering from any form of gastrointestinal disease.

COLONEL GOTAAS GETS CHILEAN  
ORDER OF MERIT

Colonel Harold B. Gotaas, Sn.C., Director of the Division of Health and Sanitation, Institute of Inter-American Affairs, Washington, has been decorated by the Chilean Government with the Order of Merit. Before joining the Army in 1942, Colonel Gotaas was Professor of Sanitary Engineering at the School of Public Health, University of North Carolina, Chapel Hill.

MARY PEMBERTON NOURSE FELLOWSHIP  
IN PUBLIC HEALTH AWARDED

Vassar College, Poughkeepsie, N. Y., has announced the award of the Mary Pemberton Nourse Fellowship in Public Health, which is offered every four years, to Mrs. Donald E. Kent, at present health consultant in the public schools of Winston-Salem, N. C. Mrs. Kent is a graduate of Agnes Scott College in 1933 and received an A.M. degree at Emory University in 1934. She has been health education coordinator in Anderson County, Tenn., and has worked on the malaria control

program in more areas of the U. S. Public Health Service. She will use the Fellowship for further study at the University of North Carolina in the evaluation of methods and materials for health education.

HAWAII PUBLIC HEALTH ASSOCIATION  
ORGANIZED

An organization meeting of the Public Health Society of the Territory of Hawaii was held on April 24. A Constitution and By-Laws, patterned after that of the American Public Health Association and affiliated societies, was adopted and officers were elected as follows:

*President:* Kaarlo W. Nasi, P.A. Sanitary Engineer, USPHS

*Vice-President:* Theodore Rhea, Director, Palama Settlement

*Secretary:* Elmer Anderson, Director of Public Health Education, Board of Health

*Treasurer:* Myrtle Payne, R.N., Castle and Cooke, Ltd.

*Members of Executive Committee at Large:* Dr. C. L. Wilbar, President, Board of Health; Dr. Raymond Nebelung, Ex. Director Health Committee, Honolulu Chamber of Commerce; Dr. Joseph A'icata, University of Hawaii

Efforts are under way by the newly organized Association to promote membership in the American Public Health Association.

DR. KAMAL OF EGYPT DELEGATE  
AT UNCTO

Among the delegates at the United Nations Conference, San Francisco, recently closed, was Dr. Ahmed M. Kamal, the Director General of the Department of Preventive Medicine in the Egyptian Ministry of Health. Dr. Kamal is also President of the Egyptian Public Health Association with offices in Cairo.

During his stay in the United States Dr. Kamal has visited a number of health departments including those in California, the Tennessee Valley Au-

thority, New York City, Chicago, and Boston. The Egyptian Public Health Association was founded in 1926 and is an inclusive type of professional society representative not only of the medical officers of health but of other specialties and includes Fellows, members, and associates. The official publication is the *Journal of the Egyptian Public Health Association*, which is published largely in Arabic. Dr. Kamal visited the offices of the American Public Health Association and the National Health Council on June 26.

#### DR. PAULA SOUZA OF BRAZIL DELEGATE TO UNCIO

Dr. G. H. de Paula Souza, formerly Director of the School of Hygiene, Sao Paulo, Brazil, and presently Chief of the Epidemic Disease Section of UNRRA in Washington, has been made a member of the Brazilian delegation to the United Nations Conference in San Francisco. Dr. Paula Souza, who is a graduate in public health from Johns Hopkins University School of Hygiene and Public Health, Baltimore, in 1920, has served as Vice President of the A.P.H.A.

#### HEALTH CENTERS AND SCHOOLS AS WAR MEMORIALS

The Society of State Directors of Health and Physical Education, of which Frank S. Stafford of the U. S. Office of Education, Washington, is President, has directed attention to the desirability of including schools as one of the major types of living war memorials through the construction of new buildings and the addition of memorial swimming pools, athletic fields, gymnasiums and playgrounds to existing schools.

With the increasing emphasis on functional memorials, health workers will wish to take advantage of opportunities of emphasizing public schools as well as health centers as a type par excel-

lence of such functional war memorials of use to all the people.

#### NATIONAL TUBERCULOSIS ASSOCIATION ELECTS NEW OFFICERS

At the June meeting of the Executive Committee of the National Tuberculosis Association held in New York, N. Y., the following officers were elected for the succeeding year.

*President:* Will Ross, Wisconsin  
*President-elect:* Dr. Victor F. Cullen, Maryland  
*1st Vice-President:* Dr. H. Stuart Willis, Michigan  
*2nd Vice-President:* Dr. Philip H. Pierson, California  
*Honorary Vice-Presidents:* Hon. Harry S. Truman, Washington, D. C.; Surgeon General Thomas Parran, Washington, D. C.  
*Secretary:* Dr. Charles J. Hatfield, Pennsylvania  
*Treasurer:* Livingston Platt, New York, N. Y.

#### CUBAN DOCTORS RECRUITED BY UNRRA FOR SERVICE IN EUROPE

The United Nations Relief and Rehabilitation Administration announces the arrival in Washington of 9 Cuban doctors enroute to work on the program of medical and health assistance which UNRRA is carrying on in the liberated areas of Europe. This is the first group of physicians recruited in Latin America for such service. They are:

Bernardo Antonio Santamarina Hernandez  
 Rodrigo A. Bustamante Mercayda  
 Rene Cirilo Vallejo Ortiz  
 Oscar Ferrer Cros  
 Enrique Roig Fernandez  
 Amaury Sabino Escalona Almeida  
 Lidio Onelio Mora Morales  
 Regino Rodriguez  
 Antonio Saniz de la Pena y Nodarse

#### INDIANA STATE COUNCIL FOR MENTAL HEALTH

Governor Ralph E. Gates recently appointed five members to the Indiana Council for Mental Health, a group

set up under 1945 legislation to develop the construction of a mental hospital and clinic on the campus of the Indiana University Medical Center in Indianapolis. Members of the Council are Dr. LaRue D. Carter, Professor of Neurology; Dr. Thurman B. Rice, Chairman of the Department of Bacteriology and Public Health and Acting Secretary of the State Board of Health, ex officio; Dr. Norman M. Beatty, Indianapolis; Judge John H. Morris, New Castle, and Otto Walls, Director of the State Department of Public Welfare, ex officio.

The 1945 general assembly appropriated \$250,000 for the project and earmarked an additional \$75,000 if needed. The hospital will be made available for instruction of medical students, student nurses, interns and resident physicians under the supervision of the medical school faculty. The council will have the authority to transfer psychiatric patients in state hospitals from one institution to another or to the so-called screening hospital on the Indiana University Medical Center Campus, admission to which will be open to voluntary applications on recommendation of attending physicians.

DR. STAFFORD M. WHEELER  
KILLED IN ACTION

Stafford M. Wheeler, M.D., Senior Lieutenant, U. S. Naval Medical Corps, was killed by the explosion of a land mine while on duty with the U. S. Typhus Commission near Zenica, Yugoslavia, on April 13, 1945.

Dr. Wheeler was a graduate of the Harvard Medical School and under appointment as Associate Professor of Epidemiology at the DeLamar Institute of Public Health, Columbia University, New York. He was a Fellow of the Epidemiology Section, A.P.H.A. Entering the Naval Service in June, 1942, he was stationed for two years at the Naval Medical Center in Bethesda,

Md., where he taught epidemiology. After a tour of submarine duty he went in November of 1944 to work with the Typhus Commission under Brigadier General Leon A. Fox. He had been assigned to work with a Partisan Army unit in Bosnia and Herzegovina. The fatal accident occurred near Sarajevo. He is survived by his wife, Anne B. Wheeler, and two children who live in Bethesda, Md.

LT. COL. RALPH S. MUCKENFUSS; M.C.,  
AWARDED LEGION OF MERIT

Lieutenant Colonel Ralph S. Muckenfuss, Medical Corps, Army of the United States, has been awarded the Legion of Merit for exceptional and meritorious conduct in the performance of outstanding services as Commanding Officer of the First Medical General Laboratory from June 28, 1943, to January 19, 1945. The citation signals Colonel Muckenfuss's initiative and energy in setting up the First Medical General Laboratory in the United Kingdom. Under his supervision, the only blood bank in the United Kingdom was organized. As United Kingdom Consultant in Research he did much to further the scientific background of medical practice in the European Theatre of operations. Dr. Muckenfuss entered the military service from his post as Director of Laboratories of the New York City Health Department.

STATUS OF MICHIGAN HOSPITAL  
COMMISSION CHANGED

The State Hospital Commission will be known as the Department of Mental Health, in accordance with a recently enacted law which becomes effective September 7. The act further sets up a five member, policy determining commission by appointment of the Governor to make policies and adopt rules and regulations governing the operation of the department. The department is to be housed in suitable offices in

Lansing. With the creation of the new Department of Mental Health, the old State Hospital Commission will be abolished.

#### U. S. CADET NURSE CORPS RECRUITMENT

During the last 12 months, 61,471 new student nurses have enrolled in Schools of Nursing, Surgeon General Thomas Parran of the Public Health Service, Federal Security Agency, who administers the U. S. Cadet Nurse Corps, announced. This is the second consecutive year the corps has exceeded its recruitment quota.

The quota for the fiscal year ending June 30 was 60,000, he said. For the last six months of 1945 the annual quota will be the same as last year's. Military and civilian nursing needs will be reviewed by the Public Health Service late in the year to determine whether any change in the student nurse quota is indicated in relation to the course of the war.

#### STATE HEALTH DEPARTMENT ACTIVITIES IN WEST VIRGINIA

The Public Health Council has entered an order separating the Bureau of Industrial Hygiene from the Division of Sanitary Engineering. Similar action has separated the Bureau of Dental Hygiene of the State Health Department from the Division of Maternal and Child Hygiene, setting it up as a separate unit. The new Dental Bureau will be under the direct supervision of Dr. John E. Offner, Weston, State Health Commissioner; two dental counselors will carry out the work now done by a dental consultant.

#### ALLIED HEALTH COUNCIL ORGANIZED IN ALABAMA

The Allied Health Council of Alabama was recently organized to coordinate the activities of various health groups and to conduct an educational campaign to increase interest in the

state's public health work. C. B. Bray, President of the Alabama Dental Association, and Mrs. Thelma M. Coburn, Executive Secretary of the Alabama Pharmaceutical Association, were named President and Secretary-Treasurer respectively. The Executive Board consists of B. F. Sapienza, representing the Alabama Dental Association, Mrs. Walter Bragg Smith, representing the State Nurses' Association, Elbert W. Gibbs, representing the Alabama Pharmaceutical Association, and Dr. Burton F. Austin, Montgomery, State Health Officer, representing the State Health Department.

#### TRAINING OF HOSPITAL ADMINISTRATORS

The W. K. Kellogg Foundation has made an initial grant of \$30,000 to carry on the first year's work of a three year educational project of a Joint Commission on Education of the American College of Hospital Administrators and the American Hospital Association. In the words of the President of the college, Dr. Claude W. Munger, the function of the Joint Commission is to establish "hospital administration as a bona fide profession, in the promulgation of sound educational measures for pre-service training, and in still further development and improvement of in-service education." Charles H. Prall, Ph.D., who had just completed five years with the American Council on Education, began work as director of the Joint Commission on January 1, 1945.

#### MRS. BURKE RECEIVES 1945 BORDEN AWARD

The American Home Economics Association has announced that Mrs. Bertha Shapley Burke, associate in nutrition at the Harvard University School of Public Health, Boston, has received the 1945 Borden Award for outstanding achievement in research in applied nutrition. The gold medal and

the award of \$1,000 were given to Mrs. Burke for her studies on diets of pregnant mothers and the effect of these diets on their babies. Mrs. Burke is a native of Massachusetts and a graduate of Vassar College and Columbia University who has been associated with the Child Development Laboratory at Harvard since 1932.

#### COLORADO INDUSTRIAL HYGIENE

##### ABSTRACTS AVAILABLE

Fred R. Ingram, Chief of the Division of Industrial Hygiene at the University of Colorado School of Medicine, Denver, has made available abstracts of the papers presented at the Industrial Hygiene Section of the Colorado Public Health Association conference held in Denver May 24 and 25 on the subject of Industrial Hygiene and Safety in Colorado. Contributors cover the subjects "Role of the Plant Physician," "Role of the Industrial Nurse," "Role of the Plant Industrial Hygiene and Safety Engineer," "Role of the Colorado Industrial Commission," and "Role of the Colorado Division of Public Health."

#### PERSONALS

##### Central States

MATTIE J. BULLARD, M.D.,† who has been Acting Director of the Medical Inspection Dept., Gary Public Schools, Gary, Ind., has been commissioned in the U. S. Public Health Service Reserve for service with UNRRA overseas.

D. H. SWENGEL, M.D., recently resigned as Health Officer of the Cass County (Mich.) Health Unit to accept a similar position with the Mecosta-Osceola District health unit.

FRED W. TANNER, PH.D.,\* Head of the Department of Bacteriology of the

University of Illinois, has been elected President of the Institute of Food Technologists.

RALPH TEN HAVE, M.D.,† of Grand Haven, Mich., Health Officer of Ottawa County, has resigned to enter private practice.

##### Eastern States

LOUIS I. DUBLIN, PH.D.,\* Second Vice-President and Statistician of the Metropolitan Life Insurance Company, has completed his assignment as full-time assistant to BASIL O'CONNOR,† Chairman of the American Red Cross, and as Chairman of the organization's Administrative Committee, and has resumed his duties with the Insurance Company.

W. GEORGE GOULD,† Assistant Director, Division of Legal and Protective Services, American Social Hygiene Association, is now a Lieutenant (jg) in the U. S. Naval Reserve and is on active duty assisting with the Venereal Disease Program.

IVAN C. HALL, PH.D.,\* has resigned as Professor of Bacteriology and Director of the Department of Bacteriology at the New York College of Medicine, Flower and Fifth Avenue Hospitals, in New York City.

ANNE M. HARTLEY, R.N., retired from her position with the Pennsylvania State Department of Health on June 1. She has been a member of the staff of the State Department of Health since 1909 and has served under each of the commissioners and secretaries which the Department has had.

MISS LUCILE PETRY, Director of the Division of Nurse Education, U. S. Public Health Service, Bethesda, Md., recently received the degree of Doctor of Humane Letters from Adelphi College, Garden City, N. Y., and the degree of Doctor of Laws from the University of Syracuse, Syracuse, N. Y. Miss Petry is a

\* Fellow A.P.H.A.

† Member A.P.H.A.

graduate of the University of Delaware, of Teachers College, Columbia University, and of the Johns Hopkins Hospital School of Nursing. In 1943 she became the first woman director of a division of the U. S. Public Health Service and leader of the largest uniformed women's organization in the nation, the U. S. Cadet Nurse Corps.

MAJOR ISRAEL WEINSTEIN, M.C.,\* was awarded the Purple Heart as a result of having been wounded April 25, 1945, near Regensburg, Germany, during very heavy fighting. Major Weinstein is Division Medical Inspector and Assistant Surgeon of an infantry division. Since August, 1942, he has been on military leave from the New York City Health Department, where he is Assistant Director of the Bureau of Health Education. The Major was awarded a Purple Heart in World War I when he was a Lieutenant in the Sanitary Corps. At present, he is with his division in Germany.

#### Southern States

ERNEST W. GOODPASTURE, M.D., Professor of Pathology at Vanderbilt University School of Medicine and recipient of the Sedgwick Memorial Medal from the American Public Health Association in 1944, has been appointed Dean of the Vanderbilt University School of Medicine succeeding W. S. LEATHERS, M.D.,\* past President of the American Public Health Association, who has retired.

CHARLES REAGAN from the U. S. Public Health Service, was appointed as Sanitarian in Kanawha County, W. Va., succeeding JOSEPH L. DERMODY who resigned recently to accept a post with the U. S. Public Health Service at Washington.

MARGUERITE STILLMAN of Morgantown, W. Va., was appointed, June 7, as Field Representative for the

Division of Vital Statistics. Miss Stillman will visit registrars, physicians, midwives, etc., throughout the state in an effort to bring West Virginia's birth registration up to at least the 90 per cent minimum required by the Bureau of the Census.

#### CHANGES IN HEALTH OFFICERS IN WEST VIRGINIA

JAMES A. DOLCE, M.D.,† Fairmont, has resigned as Health Officer of Marion County, effective April 23.

CLAUDE A. THOMAS, M.D., who has been serving as Health Officer of District Number 4, comprising the Counties of Lewis, Calhoun, Gilmer, and Upshur, during the absence because of illness of DR. WALTER J. RILEY,† Weston, has been transferred to Romney, where he will be in charge of District Number 5, including the Counties of Hardy, Grant, Hampshire, Mineral, and Morgan. Dr. Riley has returned to his activities in District Number 4.

COL. WILLIAM L. WILSON, of Dallas, Tex., and Washington, D. C., Deputy Director of SHAEF's Public Health Branch, has been awarded the U. S. Typhus Commission's Medal for "exceptionally meritorious service which materially assisted in reducing the incidence of typhus in northwestern Europe." Col. Wilson was assigned to develop plans for control of the disease in that area, particularly among refugees and displaced persons.

C.-E. A. WINSLOW, DR.P.H.,\* COLONEL IRA V. HISCOCK,\* and DR. CLAUDE W. MUNGER † have been named as Board of Surveyors charged with the direction of the coming health and hospital survey sponsored by the Washington Metropolitan Health Council, a Division of the Council of

\* Fellow A.P.H.A.

† Member A.P.H.A.



Social Agencies, for the Washington Metropolitan Area.

### Western States

JOHN A. CARSWELL, M.D., of Santa Barbara, Calif., has resigned as Health Officer of Santa Barbara County.

IRA O. CHURCH, M.D.,\* has been appointed County Health Officer of Santa Barbara County, Santa Barbara, Calif., succeeding JOHN A. CARSWELL, M.D.,† who has resigned to become Medical Director of the Grand View Hospital, Ironwood, Mich. Dr. Church has recently spent three years as Director of the Branch County Health Department in Michigan, previous to which time he was in Northern California.

LT. COL. ALBERT S. McCOWN, M.C., A.U.S.,\* has been named Surgeon of the Port Dispensary, San Francisco Port of Embarkation and Port Industrial Medical Officer, with headquarters at Fort Mason, Calif. Colonel McCown has served recently with Supreme Headquarters, A.E.F. in the G-5 and Mission to France organizations.

NICOLAI N. RILCOFF, M.D., formerly Venereal Disease Control Officer with the Kern County Health Department, California, has been appointed Health Officer of the County, succeeding Dr. JOHN K. COKER, JR.,† Bakersfield, effective April 1.

### Canada

THE HONORABLE R. PERCY VIVIAN,† Minister of Health and Public Welfare of Ontario, has been appointed to the chair of Health and Social Medicine at McGill University. No date has been announced for the assumption of his new duties pending the completion of projects in which he is now engaged as Minister of Health.

### Foreign

RODOLFO MASCARENHAS, M.D.,† São Paulo, Brazil, Assistant to the Director of the State Health Department, has been studying public health administration in the United States as a guest of the State Department.

SIR JOHN BOYD ORR † has retired from the Directorship of the Rowett Research Institute at Aberdeen, Scotland, and was elected a member of Parliament representing the Scottish Universities. His vote is said to have represented the largest majority ever given to a candidate. Sir John hopes to revisit the United States after the war.

NORMAN C. PARFIT, M.D.,† has returned to Oxford, England, after spending some years as Associate Professor of Public Health in the West China Union University School of Medicine, Chengtu, China.

ELIZABETH REED, R.N., who for two years has served as consultant nurse with the Office of the Coordinator of Inter-American Affairs in Brazil, has returned to the United States and has been appointed Director of the Visiting Nurse Association in Jacksonville, Fla.

### Death

ALBERT WALTON ROTH, M.D., a founder and President of the Tulsa Public Health Association, Oklahoma, died March 17, aged 71.



A Healthy Sign to the Busy  
**PUBLIC  
HEALTH  
INSPECTOR**

**DIXIE CUPS**

\* Fellow A.P.H.A.

† Member- A.P.H.A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 35

September, 1945

Number 9

## Evaluation of Methods to Control Air-borne Infections\*

JAMES E. PERKINS, M.D., F.A.P.H.A.†

*Division of Communicable Diseases, State Department of Health, Albany, N. Y.*

AMONG the new committees of the Association listed in the April issue of the JOURNAL is the Subcommittee for the Evaluation of Methods to Control Air-borne Infections, of the Committee on Research and Standards. This subcommittee was still being formed when that issue went to press, and only the chairman is indicated. Since then the others on the committee have accepted membership and are as follows, in alphabetical order:

F. W. Gilcreas, Assistant Director, Division of Laboratories and Research, New York State Health Department, in charge of Laboratories for Sanitary and Analytical Chemistry.  
Alexander Hollaender, Senior Biophysicist, U. S. Public Health Service

Captain Alexander Langmuir of the Army Epidemiological Board's Commission on Acute Respiratory Diseases, Fort Bragg, N. C.

O. H. Robertson, M.D., Professor of Medicine at the University of Chicago, and Chairman of the Army Epidemiological Board's Commission on Air-borne Infections

William F. Wells, Associate Professor of Research in Airborne Infection, University of Pennsylvania Medical School

George M. Wheatley, M.D., Assistant Medical Director of the Metropolitan Life Insurance Company, and Secretary of the American

Public Health Association School Health Section

C. P. Yaglou, Associate Professor of Industrial Hygiene, Harvard Medical School.

The formation of this committee is a recognition of the need for a coördinating group representing a variety of professional workers interested in and concerned with the problem of the control of air-borne infection. This problem concerns the bacteriologist, epidemiologist, practising physician and surgeon, hospital administrator, ventilating engineer, illuminating engineer, physicist, health officer, school administrator, plant manager, and office manager (to say nothing of the group most concerned of all, the general public).

The brilliant results from improvement in environmental sanitation as a result of purification of water supplies, proper disposal of sewage, and sanitary production and pasteurization of milk, are in contrast with the failure thus far to control air-borne infections (using the term in its broadest sense to include droplets and dust), with the exception of those few diseases in which there has been developed an effective means of active immunization. If the control of infections of the respiratory tract can be applied at the point of the mode of transmission rather than at the point of

\* Special Review Article, prepared at the request of the Editorial Board.

† Chairman, Subcommittee for the Evaluation of Methods To Control Air-borne Infections.

decreasing the susceptibility of the potential victim, there are certain obvious advantages; namely, (1) protection against many diseases at one time through application of a single procedure, and (2) the protection of large numbers of individuals regardless of their individual understanding of the problem, through application and supervision of the control method by a relatively small group of individuals. These are the same advantages we have enjoyed in eliminating milk-borne outbreaks through pasteurization of milk, and eliminating water-borne outbreaks through improvement of water supplies. The matter is more complicated with regard to air-borne infection, since ordinarily relatively small numbers of individuals are exposed intramurally to a single common air supply, compared to the large numbers of individuals often served by a single water or milk supply.

The current interest in the problem and the tremendous increase in the volume of literature on the subject represent a marked recent change in our conception of air-borne infection. It may be worth while to review briefly the history of changes in our conception of the rôle of air in transmitting communicable diseases, and to outline the problem confronting the new subcommittee.

Following the demonology conception of the etiology of disease the miasmatic theory of the causation of communicable diseases held dominant sway until the end of the last century. Air-borne transmission of disease is such a convenient and reasonable manner of explaining all plagues that its ready acceptance is understandable.

About the middle of the last century, however, and still prior to the development of the science of bacteriology, certain careful epidemiologic studies were made with regard to enteric infections, particularly cholera and typhoid fever

by Budd<sup>1</sup> and Snow,<sup>2</sup> respectively, in which it was made clear that these particular diseases were transmitted largely through the introduction of human excreta into water supplies. Since these diseases, as well as all the others, were then explained currently on the miasmatic theory, these demonstrations were serious blows to the theory of air-borne transmission.

When the science of bacteriology was established, following the brilliant work of Pasteur and Koch, these earlier epidemiologic observations concerning cholera and typhoid fever were confirmed, and, furthermore, certain additional experiments were conducted which raised the question as to whether or not there was true air-borne transmission of *any* communicable disease. Some of the earliest of these experiments were reported in 1897 and 1899 by Professor C. Flüge<sup>3, 4</sup> of the University of Breslau, based principally on the work of Laschtschenko.<sup>5</sup> He called attention to the fact that droplets of saliva are thrown off from the mouth during sneezing, coughing, and loud talking, and he also apparently demonstrated, through exposing plates at various distances from the subject, that these droplets quickly settled. He concluded that true air-borne infection other than within a few feet of the "infector" was unimportant.

A further blow was dealt the theory of air-borne infection by Dr. Charles V. Chapin, the eminent sanitarian from Providence, R. I., whose critical evaluation of public health administrative procedures resulted in marked improvement in such practice in the United States during the first third of this century.

Dr. Chapin was born in 1856 and became Superintendent of Health for the City of Providence in 1884, thirteen years before the publication of Flüge's first article mentioned above. He retained this position until June, 1931, a total of forty-eight years, and died

in 1941. Throughout his life he was particularly interested in the manner of transmission of communicable diseases, and rightly "debunked" many practices which were in vogue at the time he started his investigations, particularly the practice of terminal fumigation.

One of his most notable contributions was his book *The Sources and Modes of Infection*, first published in 1910 and revised in 1912. One chapter in this book<sup>6</sup> is devoted to the subject of infection by air. The first two sentences of that chapter read: "From time immemorial the air has been considered the chief vehicle of infection. This was but natural, for until recently the virus of the infectious diseases was believed to be gaseous, or at least readily diffusible, and readily borne by air currents." And he concludes this first paragraph with the statement, ". . . the inquiry here made is whether the virus of the infectious diseases is borne by the air, either free or attached to small particles of inanimate matter."

Chapin then goes on to review exhaustively the evidence for and against aerial transmission, discussing the data critically. He places great stress upon bacteriologic findings, particularly the studies by Flüge mentioned above. In this discussion he notes the fact that bacteria have been isolated from the air, and even cautions: "While the tendency is thus away from air infection we must be on our guard lest our generalization carry us too far. It may be a fact that most diseases are not air-borne, and yet further investigation may show that certain other diseases concerning which we are still in doubt may be usually transmitted in this way."<sup>7</sup> Nevertheless, toward the end of the chapter he concludes: ". . . Bacteriology teaches that former ideas in regard to the manner in which disease may be air-borne are entirely erroneous; that most diseases are not likely to be

dust-borne; and they are spray-borne only for two or three feet, a phenomenon which after all resembles contact infection more than it does aerial infection as ordinarily understood . . . There is no good clinical evidence that the common diseases are air-borne . . ."<sup>8</sup>

In the last two paragraphs of this chapter, comprising a general discussion, he states:

In reviewing the subject of air infection it becomes evident that our knowledge is still far too scanty, and that the available evidence is far from conclusive. Yet it is of the greatest practical importance that we should know definitely just what danger there is in air-borne infection, and in what diseases it is to be feared. Infection by air, if it does take place, as is commonly believed, is so difficult to avoid or guard against, and so universal in its action, that it discourages effort to avoid other sources of danger. If the sick room is filled with floating contagium, of what use is it to make much of an effort to guard against contact infection? If it should prove, as I firmly believe, that contact infection is the chief way in which the contagious diseases spread, an exaggerated idea of the importance of air-borne infection is most mischievous. It is impossible, as I know from experience, to teach people to avoid contact infection while they are firmly convinced that the air is the chief vehicle of infection. . . . Without denying the possibility of such infections, it may be fairly affirmed that there is no evidence that it is an appreciable factor in the maintenance of most of our common contagious diseases. We are warranted, then, in discarding it as a working hypothesis and devoting our chief attention to the prevention of contact infection. . . .<sup>9</sup>

It is clear from these statements that Chapin still had an open mind on the subject and that he almost deliberately stressed contact infection out of proportion to the evidence then available as to its relative importance, because he realized that acceptance of an air-borne hypothesis would result in a defeatist attitude so far as important, simple hygienic practices were concerned, such as hand washing.

These views had a tremendous influence in shaping the thought and direct-

ing the practice of health officers; particularly in this country. They did indeed discard true air-borne infection as a working hypothesis and seemingly forgot, as well, Chapin's warning as to possible revision of the conception upon further investigation. For almost a quarter of a century air-borne transmission of communicable diseases was assumed to be essentially nonexistent, other than that due to droplet spray within a few feet of the infectious individual. Clinical and epidemiologic observations contrary to this stand were ignored, or in the case of hospital cross-infections of measles and chicken pox, were conveniently considered *ipso facto* evidence of errors in nursing techniques.

Incidentally, these opinions by Chapin concerning air-borne infection are about the only ones he expressed which have not completely withstood the test of time. As Winslow has recently stated:

In one respect only have the studies of the last twenty years indicated a real modification of Chapin's viewpoint. This is with regard to the importance of aerial dissemination of infection. . . . It seems certain that in the case of the virus diseases the radius of atmospheric dissemination is wider than Chapin thought; and this is probably also true in the case of certain respiratory infections due to bacteria. On the whole, however, the broad principles of the epidemiology of 1910 remains unchallenged; and the application of those principles has been attended with phenomenal success.<sup>10</sup>

The recent reversal of our conception of air-borne infection starts only a little over ten years ago in 1933, when there appeared the first of a series of articles by William Firth Wells, an engineer. In this article, Wells, who was then with the Harvard School of Public Health, described an apparatus he had devised, called an air centrifuge, permitting quantitative determination of bacteria in air with reproducible results under the same conditions, and he concludes: "In the study of the bacterial sources of aerial contamination, experiments have been made to determine under what

conditions bacteria are given off by persons confined in a limited space. This inquiry leads also to an investigation of the physical, chemical, and biological properties of droplets in connection with the theory of droplet infection."<sup>11</sup> Here, then, was a better means of accomplishing what Chapin in 1910 had stated was needed to clarify the problem when he said: ". . . As Winslow in his work on sewer air . . . has so clearly pointed out, a quantitative examination of the floating bacteria is necessary if we wish to determine the real danger from the inhalation of the air."<sup>12</sup>

In 1934, Wells published two papers simultaneously entitled "Droplets and Droplet Nuclei"<sup>13</sup> and "Viability of Droplet Nuclei Infection,"<sup>14</sup> reporting on the results of experiments conducted in the spring and summer of 1933 and presented before the American Association for the Advancement of Science on December 27, 1933. In the first paper he points out that although it is true that larger droplets ejected at the height of two meters or, roughly, the height of a man, will fall to earth within a few feet of the source, smaller droplets evaporate so rapidly that they will evaporate before they will settle to the ground, leaving in the air, in a state of suspension, the bacteria or other particulate matter contained in the droplets. These so-designated "droplet nuclei" remain suspended indefinitely and are readily wafted by air currents. He finds that "Somewhere between .1 and .2 mm. (diameter) lies the droplet size which identifies the droplets of mouth spray that reach the ground within the life of the droplet as against droplets that evaporate and remain in the air as droplet nuclei with attached infection." Although temperature and humidity, and the presence of dissolved substances affect the rate of evaporation to a certain extent, droplet size is the predominating factor.

To demonstrate the actual occurrence of such droplet nuclei, he adopted Tyndall's experiments on atmospheric dust by constructing a tight cylindrical tank 7 feet long, and of the same diameter, along the axis of which was projected a powerful beam of light. Ports along the side of the tank gave a perpendicular sight on the beam, revealing any suspended particles entering its path. When pure water was atomized into this beam it appeared like steam in cold air, which subsided completely when the spray ceased, with the light beam then completely invisible. When an atomized suspension of *Bacillus subtilis* was injected, a delicate pale blue smoke band remained in the path of the beam. Even after this disappeared and the beam became invisible, Wells was able to collect living bacteria from the air by attaching his air centrifuge to the tank and, in fact, was able to recover bacteria from the interior of the tank a week after inoculation.

In his conclusions, Wells states:

Droplet infection is essentially localized and concentrated while infection broadcast by droplet nuclei is dispersed and dilute. Thus, it readily escapes detection by the instruments previously devised for atmospheric exploration. Failure to discover air-borne infection bacteriologically no more proves its absence, therefore, than failure to isolate *B. typhosus* from a sewage polluted water proves that typhoid fever cannot be conveyed by drinking water.

In a second paper<sup>14</sup> he reports on testing in the same chamber by the same method atomized suspensions of pathogenic bacteria which, of course, are more delicate than *B. subtilis*. He found that he could recover pneumococci, streptococci, and diphtheria bacilli 24 hours after the original atomization. He concludes that these results make apparent "that the time and distance droplet nuclei may travel depend more upon the viability of the organisms in air than upon settling rates."

These experiments, then, clearly indi-

cated that exposure of open plates, which was the bacteriologic procedure employed by early investigators and which led to the conclusion that viable organisms were expelled only a few feet by human beings, was an unreliable method of determining the infectiousness of air since small particles do not settle and thus would not be "registered" on the plates; the plates catch only the larger droplets which fall to earth close to the subject.

The next step was actual demonstration of infection in animals in such a manner that the microorganisms or viruses definitely were carried by the air stream, with elimination of the possibility of direct droplet infection. These experiments, conducted by Wells and others,<sup>15-22</sup> involved such successful transmissions as influenza to ferrets and mice, tuberculosis to rabbits, and poliomyelitis to monkeys.

With the development of these experimental techniques it was possible to experiment with agents which might prevent such air-borne transmission. Such experimentation has extended principally in four directions: (1) physical barriers (face masks, filters, cubicle and room partitions, and control of air currents through differential air pressure),<sup>23-25</sup> (2) disinfection of air through ultra-violet radiation,<sup>15, 16, 21, 26-34</sup> (3) disinfection of air through the use of disinfectant vapors,<sup>35-43</sup> and (4) laying of dust and lint through application of oil to floors and bedding.<sup>44-48</sup>

The problem as a whole, then, facing the Subcommittee for the Evaluation of Methods to Control Air-borne Infections may be summarized as in Table 1.

The above indicates the scope of the problem but the subcommittee decided at its first meeting on June 4 that it does not consider it within its province to evaluate control methods concerned with the primary reservoir (isolation and quarantine, chemotherapy, and

TABLE 1

*Possible Methods to Control Air-borne Infections in Enclosed Spaces*

<i>Point of Application</i>	<i>Method of Control</i> (Considering only enclosed atmospheres)
1. At reservoir of infection	
a. primary (human; atomization)	1. isolation and quarantine
(1) droplets	2. chemotherapy
(2) droplet nuclei	3. other methods of rendering non-infectious (e.g., tonsillectomy in diphtheria)
b. secondary (inanimate; turbulence)	oiling
(1) dust	
(2) lint (bedding, clothes, bandages, etc.)	
2. At susceptibility of individual	1. vaccines and sera
	2. chemoprophylaxis
3. At mode of transmission from reservoir to susceptible individual	1. mechanical (physical barriers)
	a. masks
	b. partitions
	c. differential air pressure (controlled currents)
	d. filters
	2. dilution of air
	3. reduction in crowding
	4. disinfectant radiation
	a. daylight
	b. artificial illumination
	(1) visible light
	(2) ultra-violet light
	5. disinfectant vapors

other methods to render the individual non-infectious). Nor is it concerned with reducing susceptibility of individuals to such infections (vaccines, sera, and chemoprophylaxis). Conversely, it considers its function to extend beyond the scope indicated by the table in that it is definitely concerned with the true relative importance of modes of transmitting infections of the respiratory tract by media other than the air.

The subcommittee plans to present its findings in a series of annual reports (possibly more frequently when indicated), presenting critical summaries of

published papers bearing on the problem, and giving specific recommendations as to application of the various control procedures. In this evaluation it will use the technical advice available through other committees of the Association concerned with this problem\* and will work closely with comparable committees of other organizations, such as the Committee on Air Sterilization and Odor Control of the American Society of Heating and Ventilating Engineers, the Committee on Air Sterilization of the American Hospital Association, and the Council on Physical Medicine of the American Medical Association.

## REFERENCES

1. Budd, William. Typhoid Fever—Its Nature, Mode of Spreading and Prevention, final paper published in 1874, based upon earlier papers dating back to 1849. Republished for Delta Omega in 1931 by the American Public Health Association.
2. Snow, John. On the Mode of Communication of Cholera, final paper published in 1855, based upon

\* Particularly the Laboratory Section's Standard Methods Committee for the Examination of Germicides and Antibacterial Agents with Associate Referees for Disinfection of Air by Germicidal Vapors and Mists (O. H. Robertson), and for Disinfection of Air by Ultra-violet Irradiation (Alexander Hollaender); and the Industrial Hygiene Section's Committee on Standard Methods for Examination of Air, with Subcommittee on Bacteriological Procedures (W. F. Wells, Chairman).

- earlier papers dating back to 1849. Republished for Delta Omega by the Commonwealth Fund in 1936 in *Snow on Cholera*.
3. Flüggé. Ueber Luftinfection. *Ztschr. f. Hyg. u. Infectiönskrr.*, 25:179, 1897.
  4. Flüggé. Die Verbreitung der Phthise durch Staubbörmiges Sputum und durch beim Husten verspritzte Tropfen. *Ibid.*, 30:107, 1899.
  5. Laschtschenko. Ueber Luftinfection durch beim Husten, Niesen und Sprechen verspritzte Tröpfchen. *Ibid.*, 30:125, 1899.
  6. Chapin, Charles V. *The Sources and Modes of Infection*. 2nd ed. Wiley, 1912, pp. 259-315.
  7. *Ibid.*, pp. 281 and 282.
  8. *Ibid.*, p. 313.
  9. *Ibid.*, p. 314.
  10. Winslow, Charles-Edward A. *The Conquest of Epidemic Disease*. Princeton University Press, 1943, pp. 377-379.
  11. Wells, W. F. Apparatus for Study of the Bacterial Behavior of Air. *A.J.P.H.*, 23:58-59, 1933.
  12. Chapin, Charles V. *The Sources and Modes of Infection*. 2nd ed. Wiley, 1912, p. 299.
  13. Wells, W. F. On Air-Borne Infection. Study II. Droplets and Droplet Nuclei. *Am. J. Hyg.*, 20:611, 1934.
  14. Wells, W. F., and Stone, W. R. Study III. Viability of Droplet Nuclei Infection. *Ibid.*, pp. 619-627.
  15. Wells, W. F., and Brown, H. W. Recovery of Influenza Virus Suspended in Air. *Science*, 84:68, 1936.
  16. Wells, W. F., and Brown, H. W. Recovery of Influenza Virus Suspended in Air and Its Destruction by Ultraviolet Radiation. *Am. J. Hyg.*, 24:407, 1936.
  17. Wells, W. F., and Lurie, Max B. Experimental Air-Borne Disease; Quantitative Natural Respiratory Contagion of Tuberculosis. *Am. J. Hyg.*, 34:21, 1941.
  18. Wells, W. F., and Henle, W. Experimental Air-borne Disease; Quantitative Inoculation by Inhalation of Influenza Virus. *Proc. Soc. Exper. Biol. & Med.*, 48:298, 1941.
  19. Faber, H. K., and Silverberg, R. J. Experimental Air-borne Infection with Poliomyelitis Virus. *Science*, 94:566, 1941.
  20. Faber, H. K., Silverberg, R. J., and Dong, L. Poliomyelitis in the Cynomolgous Monkey. III. Infection by Inhalation of Droplet Nuclei and the Nasopharyngeal Portal of Entry. *J. Exper. Med.*, 80:39, 1944.
  21. Lurie, Max B. Experimental Air-borne Tuberculosis. *Am. J. M. Sc.*, 209:156, 1945.
  22. Andrewes, C. H., and Glover, R. E. Spread of Infection from Respiratory Tract of Ferret; Transmission of Influenza A Virus. *Brit. J. Exper. Path.*, 22:91, 1941.
  23. Reyniers, Jas. A. The Control of Cross-Contamination by the Use of Mechanical Barriers. *Aerobiology*. Am. Assn. Adv. Sci., 1942, p. 254.
  24. Chapple, Chas. C. The Controlled Physical Environment for the Premature and Older Infant. *Ibid.*, 1942, p. 251.
  25. Rosenstern, I. Observations on the Control of Respiratory Contagion in the Cradle. *Ibid.*, 1942, p. 242.
  26. Hart, Deryl. The Importance of Air-Borne Pathogenic Bacteria in the Operating Room: A Method of Control by Sterilization of the Air with Ultraviolet Radiation. *Ibid.*, 1942, p. 186.
  27. Kraissel, C. J., Cimiotti, J. G., and Meleney, T. L. Considerations in the Use of Ultraviolet Radiation in Operating Rooms. *Ann. Surg.*, III:161, 1940.
  28. del Mundo, F., and McKhann, C. F. Effect of Ultraviolet Irradiation of Air on Incidence of Infections in an Infants' Hospital. *Am. J. Dis. Child.*, 61:213, 1941.
  29. Barrenberg, Louis H., Greene, David, Greenspan, L., and Greenberg, B. Effect of Irradiation of Air in a Ward on the Incidence of Infections of the Respiratory Tract with a Note on Varicella. *Aerobiology*, 1942, p. 233.
  30. Robertson, Elizabeth C., and Doyle, M. E. On the Control of Cross Infections in a Children's Hospital. *Ibid.*, 1942, p. 223.
  31. Brooks, G. L., Wilson, U., and Blackfan, K. D. Studies of Cross-Infection in the Infants' Hospital in Boston. *Ibid.*, 1942, p. 228.
  32. Wells, W. F., Wells, M. W., and Wilder, T. S. The Environmental Control of Epidemic Contagion. I. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools. *Am. J. Hyg.*, 35:97, 1942.
  33. Wheeler, S. M., Ingraham, H. S., Hollaender, A., Lill, N. D., Gershon-Cohen, J., Jr., and Brown, E. W. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. *A.J.P.H.*, 35:457, 1945.
  34. Radiant Disinfection of Air in Schoolrooms. *Health News*, New York State Dept. of Health, 22:57, 1945.
  35. Douglas, S. R., Hill, L., and Smith, W. The Effect of Antiseptic Sprays on the Bacterial Content of Air. *J. Indust. Hyg.*, 10:219, 1928.
  36. Twort, C. C., Baker, A. H., Finn, S. R., and Powell, E. O. The Disinfection of Closed Atmospheres with Germicidal Aerosols. *J. Hyg.*, 40:253, 1940.
  37. Masterman, A. T. Air Purification in Inhabited Rooms by Spraying or Atomizing Hypochlorites. *J. Indust. Hyg. & Toxicol.*, 20:278, 1938.
  38. Robertson, O. H., Bigg, E., Puck, T. T., and Miller, B. F. The Bactericidal Action of Propylene Glycol Vapor on Microorganisms Suspended in Air. *J. Exper. Med.*, 75:593, 1942.
  39. Robertson, O. H., Puck, T. T., Lemon, H. M., and Loosli, C. G. The Lethal Effect of Triethylene Glycol Vapor on Air-borne Bacteria and Influenza Virus. *Science*, 97:142, 1943.
  40. Harris, T. N., and Stokes, J., Jr. The Effect of Propylene Glycol Vapor on the Incidence of Respiratory Infections in a Convalescent Home for Children. *Am. J. M. Sc.*, 204:430, 1942.
  41. Harris, T. N., and Stokes, J., Jr. Air-borne Cross-Infection in the Case of the Common Cold. A Further Clinical Study of the Use of Glycol Vapors for Air Sterilization. *Ibid.*, 206:631, 1943.
  42. Harris, T. N., and Stokes, J., Jr. Summary of a Three-Year Study of the Clinical Applications of the Disinfection of Air by Glycol Vapors. *Ibid.*, 209:152, 1945.
  43. Hamburger, M., Jr., Robertson, O. H., and Puck, T. T. The Present Status of Glycol Vapors in Air Sterilization. *Ibid.*, 209:162, 1945.
  44. Andrewes, C. H. Control of Air-Borne Infection in Air-Raid Shelters and Elsewhere. *Lancet*, 2:770, 1940.
  45. van den Ende, M., Lush, D., and Edward, D. G. F. Reduction of Dust-Borne Bacteria by Treating Floors. *Lancet*, 2:133, 1940.
  46. Wright, J., Cruickshank, R., and Gunn, W. The Control of Dust-borne Streptococcal Infection in Measles Wards. *Brit. M. J.*, 1:611, 1944.
  47. Harwood, F. C., Powney, J., and Edwards, C. W. A New Technique for the Application of Dust-laying Oils to Hospital Bed-clothes. *Brit. M. J.*, 1:615, 1944.
  48. Loosli, C. G., and Robertson, O. H. Recent Studies on the Control of Dust-Borne Bacteria by Treatment of Floors and Bedclothes with Oil. *Am. J. M. Sc.*, 209:166, 1945.



# 1,200 Local Public Health Departments for the United States

HAVEN EMERSON, M.D., F.A.P.H.A.,

AND

MARTHA LUGINBUHL, M.A.

*Chairman and Research Consultant, Committee on Local Health Units,  
A.P.H.A., New York, N. Y.*

**L**OCAL *Health Units for the Nation*, published by the Commonwealth Fund in August, represents another milestone in the documentary history of public health in the United States. Noting the slow growth in complete coverage of every person in every county by a minimum framework of local health service, it boldly suggests that the apparatus for delivering such service be redesigned. Recognizing the validity for colonial times of town, village, or city responsibility for the health of their citizens, it points out the present anachronism of some 18,000 local political jurisdictions, ranging in population from eight persons to seven and a half millions, attempting the job of providing the basic local health protection of the people. If one may paraphrase the committee's report, in many areas local public health officials are traveling by covered wagon while the world in general is already in a B-29 era.

In April 1943,\* there were outlined the beginnings of the Committee on Local Health Units, whose work now reaches another phase with the publication of the new volume. This article pointed out that both the American Medical Association and the American Public Health Association in resolutions

of similar intent had in 1942 expressed "their interest in the complete coverage of the area and population of continental United States by local units of health jurisdiction."

At that time the committee estimated that approximately 40,000,000 of the people of the continental United States were living in communities where local health services had either not been undertaken at all, or, if provided for, were under the direction of part-time and generally untrained or inexperienced health officers with inadequate and often professionally unqualified assistants. This estimate has been substantiated by later inquiry of the committee which warns that "one-third of the nation lives under substandard local health organization, ill-equipped to give basic minimum health protection at all times and to meet public health emergencies quickly and efficiently."

The committee, made up of state and local health officers, representatives of the U. S. Public Health Service and schools of public health, and Foundation representatives, set itself some basic principles for guidance in its proposals for reshaping the administrative architecture of local public health. These principles grew out of the experience of the past and are worth summarizing here:

\* Units of Local Health Services for All the States: Progress Report. *A.J.P.H.*, 33, 4:404-409 (Apr.), 1943.

1. No unit of population should be without access to or coverage by the services of a professionally trained and experienced health officer serving on a full-time basis.

2. Local responsibility for public health service is a primary essential of local government and should be so specified under state statute.

3. For administrative efficiency and economy, full-time local health officers should be employed for populations of not less than approximately 50,000 each, which units of population may be made up of single counties, several counties, joint city-county units, or parts of several counties when the natural transportation and trade movements so indicate.

4. The average distance from the headquarters of an area of local health jurisdiction to its periphery should not exceed 25 to 40 miles.

5. In creating units of local health jurisdiction, such factors as per capita income, persons per physician, and number of hospital beds per 1,000 population, should be taken into consideration. In developing district outlines an endeavor should be made to group counties so as to reduce large inequalities of per capita income by combining urban and rural, high and low incomes in a single jurisdiction where otherwise desirable. An attempt should also be made to group counties so that the ratio of physicians will be not less than one to 1,500 of the population and that general hospital beds available be not less than three per 1,000 of the population.

On the basis of these principles and after examination of 1,127 suggested units for the 48 states at the 1942 annual meeting of the American Public Health Association, the committee undertook to reach agreement with state health officers as to such number and boundaries of units proposed for local health administration as would best meet the needs of the respective states. In all but two instances, there was a basis of concurrence between the committee and the state health officer, though in a number of cases agreement upon a tentative plan for districting was qualified in greater or less degree. For two states, Connecticut and Nevada, the committee suggested its own plan without the assistance of the state health officers, neither of whom was willing either to approve the commit-

tee's plan or to suggest alternative districting of his own. The agreement of the majority of state health officers with the principles and objectives of the plan was further indicated by a resolution of the Conference of State and Provincial Health Authorities of North America on March 22, 1944, urging the "early implementation of such a program . . . of evolving a plan for complete public health services as projected by the studies of the committee."

The committee proposes a plan whereby the 3,070 counties and their contained cities in the United States can be served by 1,197 units of local health administration. More than three-fourths of the units agreed upon contain populations of 50,000 or more, and only 14 per cent of less than 45,000. These represent the instances in which sparsely populated areas, natural barriers to communication, political incompatibilities among local units of government, or the judgment of the state health officers required substantial variation from the population minimum of 50,000 persons per local health unit suggested by the committee. More than one-fourth of the units include only one county, more than two-thirds are multi-county units; the remaining 5 per cent are made up of city units or of units including parts of one or more counties.

For the 1,197 units the committee undertook to obtain from competent sources of federal, state, and local government, two sets of facts; first the number of full- and part-time employees engaged in tax-supported health services at the local level, according to certain categories of professional and assistant personnel, for each proposed unit of local health jurisdiction, and second the amount expended for the salaries of these persons and the total expenses for local health services within each such suggested unit. The committee's inquiries did not extend to official state and federal personnel and costs except

where these were specifically assigned to local health services, since it was set up to make recommendations for the organization of official public health services on the local level.

The next step was to describe, in terms of persons and dollars of expense, a desirable provision of professional, technical, and lay personnel for each unit with an estimate of total expense, and of that portion required for salaries, such personnel and costs to represent adequacy for good performance of the standard local public health functions, not an optimum or maximum which professional ambition might desire, or which society might, under exceptional conditions of local intelligence, excellence of government, and high per capita wealth, demand and be ready to support.

The committee considers that a community of 50,000 persons or more should be able generally at a cost of approximately \$1 per capita to employ the number and quality of persons necessary to assure basic and reasonably adequate local health services as specified immediately below. It is recognized that a larger sum per capita, up to as much as \$2 or \$2.50 may be needed to provide also such additional services as may be found to be locally desirable and considered to be essential for an optimum local health service of comprehensive scope and superior quality. The six basic functions of a local health department include:

- a. *Vital statistics*, or the recording, tabulation, interpretation and publication of the essential facts of birth, deaths, and reportable diseases
- b. *Communicable disease control*, including tuberculosis, the venereal diseases, malaria, and hookworm disease
- c. *Environmental sanitation*, including supervision of milk and milk products, food processing and public eating places, and maintenance of sanitary conditions of employment
- d. *Public health laboratory services*
- e. *The hygiene of maternity, infancy and*

*childhood*, including supervision of the health of the school child

- f. *Health education* of the general public so far as not covered by the functions of departments of education

For a community of 50,000 persons there will be needed 1 full-time professionally trained and experienced medical officer of health, 1 full-time public health or sanitary engineer, and a sanitarian of non-professional grade, 10 public health nurses,\* one of whom would be of supervisory grade, and 3 persons for clerical work. It is expected that part-time medical services will be needed in most such units of population for diagnosis and treatment of tuberculosis and venereal diseases, and for prenatal, infant, preschool and school health conferences. It is assumed that specialist or consultant and advisory services will be available to such a local health department from the state health department in statistical procedures, in public health engineering, in public health laboratory work, in epidemiology, for veterinary purposes, for dental health, for health education, and for other local health services.

For populations of larger size (viz., 100,000 to 150,000 or over), it may be practicable and economical to include within the staff of the local health department not only additional administrative health officers (chiefs of communicable disease control, maternity and child hygiene, tuberculosis or venereal disease or industrial hygiene), sanitary officers, nurses, and clerical staff proportionate to the size of the population, but to incorporate some or all of the specialized personnel provided for the smaller community only through the

\* The committee recommends not less than one public health nurse per 5,000 population for administrative and educational purposes at the local level, not including bedside care of general sickness or maternity patients. If what may be called an inclusive nursing service for a community is to be provided with both administrative public health nursing and bedside care of the sick and maternity patients, not less than one nurse per 2,500 population will be found desirable.

part-time assistance of the staff of the state department of health. It would be expected that the staff of a single local health department for a population unit of 150,000 should include 2 or 3 full-time administrative medical officers, i.e., the commissioner of health or health officer, a chief of division or bureau of communicable diseases, including tuberculosis and venereal diseases, and a chief of division of maternity and child hygiene, including the health of school children; a chief of division of environmental sanitation who would be of professional grade and 5 assistant sanitary officers; 30 public health nurses, of whom 4 would be of supervisory grade; and 10 persons of secretarial and clerical grades, but also 1 statistical clerk or statistician, 1 full-time veterinarian, 3 persons for public health laboratory work (one of professional grade, one technician, and one unskilled assistant), 1 full-time dentist, and 2 full-time dental hygienists, and 1 health educator. Some large communities will wish to add one or more investigators for venereal disease control. Nutritionists and other types of specialists serving as part of the field staff can in larger units of population be included in the quota of public health nursing personnel. There is usually some unskilled and non-technical help employed for operating and maintenance of the health department office, collecting, messenger, and supply services.

These suggestions as to the numbers and proportions of the various categories or personnel for local health departments of different sizes of population and area are intended to serve as a guide for the average community. Wide variations in the needs of the several types of professional, technical, and other personnel are to be expected and will always depend upon peculiarities of local problems, resources, and traditions.

The picture of existing personnel and

costs for local health service as administered with more or less success by some 18,000 local jurisdictions, in addition to thousands of local boards of education, is shown in summary form in Table 1. In corresponding columns is shown the minimum personnel that would be required if the administration of local health service, including school health service, were streamlined into the 1,197 units suggested by the committee.

What are the facts? Is there present overstaffing in any category of workers? Only in one area. The committee recommends the elimination of the 4,000 or more part-time medical and lay health officers whom it discovered, and thousands of others who were not reported. The committee is categorical about few of its suggestions but on this subject it says "no equivalent personnel is recommended to replace the reported and unreported part-time local health officers, medical and non-medical, employed in 1942." It suggests rather a full-time medical health officer in each of the units and nearly 900 additional full-time administrative physicians as chiefs of bureaus, as for tuberculosis, venereal diseases, or maternal and child health. It further suggests the use of more than 6,000 local practising physicians for part-time clinical service, recognizing that many states will prefer to employ full-time clinicians.

Fewer than 15,000 public health nurses were employed by official local agencies in 1942; a minimum coverage, not including bedside care of the sick, will require more than 26,000. If bedside care of general sickness and maternity patients is also to be provided in the community, not less than twice as many nurses will be needed. Clerical service in local health departments needs to be expanded from about 5,300 to 8,900 workers. This number will provide 1 clerk per 15,000 population or 1 clerk per 3 nurses.

TABLE 1

*Existing and Suggested Personnel and Expenditures for Local Health Services in Continental United States*

	Existing (1942)			Suggested (Minimum)		
	Total	Full-time	Part-time	Total	Full-time	Part-time
<i>Personnel for Local Health Services</i>						
Total	40,782	29,201	11,581	63,865	54,357	9,508
Health Officers	5,519	1,202	4,317	1,197	1,197	....
Other medical administrators	1,065	1,065	.....	866	866	....
Clinicians, part-time	4,656	.....	4,656	6,145	.....	6,145
Public health nurses	14,274	13,742	532	26,390	26,390	....
Total sanitary personnel	5,504	4,216	288	5,807	5,796	11
Professionally trained, including engineers, veterinarians	577	539	38	1,895	1,884	11
Sanitarians, not professionally trained, including inspectors of various types	4,927	4,677	250	3,912	3,912	....
Clerical and secretarial workers, including those with statistical training	5,279	4,830	449	8,933	8,933	....
Laboratory workers	1,350	1,198	152	3,535	3,535	....
Professional	321	290	31	431	431	....
Technical	720	615	105	1,569	1,569	....
Unskilled	309	293	16	1,535	1,535	....
Dentists	1,266	307	959	3,789	447	3,342
Dental hygienists	372	318	54	4,267	4,267	....
Health educators	44	44	.....	543	533	10
Others	1,453	1,279	174	2,393	2,393	....
<i>Expenditures for Local Health Service</i>						
Total		\$77,262,600			\$127,391,000	
Per capita		\$0.61			\$0.97	
Salaries		62,722,600			99,698,500	
Other Expenses		14,540,000			27,692,500	

Total sanitary personnel needs to be increased only slightly for minimum coverage. But the committee, with the full approval of the Engineering Section of the Association, recommends greater professional leadership in this field. Thus it recommends that about one-third of the 5,800 suggested workers have professional training, whereas this was true of only 10 per cent of the workers reported in 1942.

That public health dental service is only in its infancy is indicated by the fact that a substantial increase is recommended in the number of full-time and part-time dentists and dental hygienists. Fewer than 1,300 public health dentists were reported to be engaged in local health services in 1942, whereas the committee believes that nearly 3,800 are

needed—about 450 full-time and 3,300 part-time. In addition, the employment of nearly 4,300 dental hygienists is recommended, whereas only 372 were reported in 1942. The committee points out the economies to be effected by employing dental hygienists for some of the prophylactic and health education functions of a public health dental service, and recommends an analysis of the state licensing laws with a view to making such employment possible.

Only 44 specially trained health educators were reported to be employed in local health services in 1942; the committee recommends nearly 550, chiefly in units with populations of 100,000 or more. In the smaller units, it believes such service must come largely from the state departments of health

unless resources beyond \$1 per capita are available.

The committee has laid down no general principles about laboratory service except to indicate the probability that greater economy and efficiency will generally be achieved through branches of the state laboratory than through local health unit laboratories. In 12 states it has suggested no local laboratory service because present plans indicate coverage by the respective state laboratories and their branches. In all other units except those with populations of well over 100,000 it recommends only modest personnel in the expectation that the state laboratory will provide both professional supervision and assistance in the more complicated diagnostic procedures.

This analysis, perhaps the most comprehensive presently available, of official public health personnel in local health departments and the forecast of minimum needs have great significance for the public health professions. Here is an estimate of the least that will be needed in money and personnel to get every citizen of the 48 states and the District of Columbia under the umbrella of full-time local health service. It gives schools of public health, of public health nursing, and of public health or sanitary engineering a basis for estimating their post-war capacities and probable demand for training, and for planning their curricula. It charts for foundations interested in pioneering new paths in public health the areas of immediate need and usefulness. What, for example, might not come out of a few strategic demonstrations of public health dental service, or of integrated public health and school service on a high level of quality? Are there new training techniques to be developed either in public health schools or through the state training centers that have been developed to meet acute wartime personnel shortages?

If, as seems possible, local health departments will be authorized and required by law in the future to assume responsibilities for the diagnosis and treatment of the sick, as well as for the public health care of their citizens, surely there can be no better preparation than to have efficient and economical machinery for delivering whatever services a community desires from its health department. Had such a basic modest organization as is proposed by the committee been everywhere in effect since the last World War would we now be faced with the high rate of rejections for Selective Service?

Also on the horizon of public health responsibilities are the developments that may grow out of bills now in Congress, such as Senate Bill 191 for the construction of hospitals. If such a bill were enacted into law by the Congress there would be built around the concept of a hospital area of about 1,000,000 persons a fully equipped teaching and research hospital with complete diagnostic and treatment facilities, furnishing its expert and specialist services to less fully equipped hospitals and diagnostic centers that might be likened to front line casualty stations. The administrative direction of such a service might be the responsibility of the local health officer. Such an event would challenge the local health officer with new obligations and opportunities.

The population studies of Whelpton and others have already made familiar the pattern of the changing age distribution of the population of the United States and thus the increasing significance of chronic disease for the public health administrator. For example, the median age of the population increased from 26.5 years in 1930 to 29 years in 1940. In the 30 years between 1910 and 1940, persons 45 years of age or over increased from less than one-fifth to more than one-fourth of the total population. Persons in this age group

doubled in number while the total population of Continental United States increased less than 50 per cent. As infant mortality and the diseases of childhood, particularly communicable diseases, are decreased to the lowest attainable levels, thus adding more years of average life expectancy, chronic illness and the diseases of later life, become numerically more important to the public mind and aggravate the difficulty of improving the quality as well as extending the average length of life.

Medical care, hospital service, control of chronic illness—these are but a few of the immediate developments, in addition to already accepted responsibilities, for which local health departments must

either develop or streamline their administrative machinery. The committee's report suggests one way in which this may be done. The particular proposal for a given state or a given unit, however, must be considered by the people and their local and state government, as expressing a principle of administration, not a finality for action. Another arrangement of counties and populations may be preferable. The principle of local coöperation, however, and the pooling of community resources in the interest of economy and efficiency are important, and resemble those that have brought about consolidated school districts and road districts serving large areas with engineering adequacy.

---

## Commissioned Corps of U. S. Public Health Service to be Branch of Armed Forces

The commissioned corps of the U. S. Public Health Service will become a branch of the land and naval forces of the United States under an Executive Order signed by President Truman on June 21. The order was effective July 29 for the duration of the war.

Administration of the U. S. Public Health Service is not affected by the Executive Order. The Service continues to operate as a part of the Federal Security Agency. U. S. Public Health Service officers will be subject to the Articles for the Government of the Navy, with authority conferred by the Article and by law on the Secretary of the Navy and the Commander of a fleet vested in the Federal Security Administrator and the Surgeon General of the U. S. Public Health Service.

Officers of the U. S. Public Health Service on detail to the Army and Navy, however, will continue to be governed by the laws of the service to which they are assigned.

Under the Executive Order, commissioned officers of the service will be subject to the same discipline and obligations and will have the same status as members of the Army, the Navy, and the Coast Guard. Their post-war status will be the same as that of all other veterans. The order also establishes uniformity in discipline and benefits among Public Health Service commissioned personnel.

The commissioned corps totals 3,175, and is made up of physicians, dentists, sanitary engineers, pharmacists, scientists, and nurses.

# Scarlet Fever in Schoolrooms

Outbreaks Due to Serologically Typed Hemolytic Streptococci

A. DANIEL RUBENSTEIN, M.D., M.P.H., AND  
GEORGE E. FOLEY

*State Department of Public Health, Boston, Mass.; and Department of  
Preventive Medicine and Epidemiology, Harvard Medical  
School and School of Public Health, Boston, Mass.*

FUNDAMENTAL concepts concerning the epidemiology of infectious disease may be acquired by studying its spread among basic units of population. Chapin<sup>1</sup> was among the first to study the dissemination of scarlet fever in schools. More recently, the importance of the schoolroom in the epidemiology of scarlet fever was re-emphasized by the statistical studies of Wilson, Bennett, Allen, and Worcester.<sup>2</sup> Interest in the prevention of air-borne infection by the use of ultraviolet light,<sup>3</sup> by the disinfection of air with aerosol solutions,<sup>4</sup> and by the prophylactic use of the sulfonamides<sup>5</sup> has created a need for further inquiry concerning the spread of disease in hospitals, schools, and other closed population groups.

The differentiation of Lancefield Group A hemolytic streptococci<sup>6</sup> into serological types<sup>7</sup> provided a tool with which the transmission of scarlet fever in schools and similar population groups can be studied with greater accuracy than was possible heretofore. This approach has been applied more widely in England than in this country. Griffith<sup>8</sup> observed that scarlet fever outbreaks in schools are usually due to a single serological type of hemolytic streptococci. De Waal<sup>9</sup> concluded that during the height of an epidemic of scarlet fever which he observed in Edinburgh, the majority of cases occurred among children of school age; and the majority of cases from a given school-

room were due to the same serological type of hemolytic streptococci.

The schoolroom environment is particularly appropriate for epidemiological investigations concerning scarlet fever. Its population is relatively stable. The introduction of a new type of disease producing hemolytic streptococci may be detected readily. In the classroom it may be possible to define the rôle of the healthy carrier, the missed case, and the convalescent case in the general pattern of spread of the causative organism. Should an outbreak occur, the proportion of scarlet fever cases and their relation to other streptococcal infections due to the same serological type of hemolytic streptococci may be determined with little difficulty. Under certain circumstances, subsequent transmission of the infectious agent may be followed closely not only within the schoolroom but beyond its limits to the family contacts.

During the investigation of a recent schoolroom outbreak of scarlet fever, it was found that all cases were produced by a single serological type (Griffith Type 5) of hemolytic streptococci. Further study revealed that valuable information concerning the epidemiology of scarlet fever could be derived from such investigations. Accordingly, similar research was instituted in other schoolrooms where there was an increased incidence of the disease. It became apparent at once that elementary school classrooms with multiple cases of scarlet



fever could be found in almost any community where the disease was prevalent. This investigation was limited to a small group of schoolrooms in conveniently located communities.

METHODS

Data were obtained from six schoolrooms in four communities (Table 1) during the course of the scarlet fever season of 1943-1944. With one exception (No. 1), the classroom studied in

schoolroom cases. As secondary cases occurred among these family contacts, cultures were taken to determine the etiological type of hemolytic streptococci. In addition, nose and throat cultures were obtained from a random sample of the cases occurring in each community to determine the serological types producing scarlet fever during the course of the schoolroom outbreaks.

All contacts were examined periodically for evidence of streptococcal in-

TABLE 1  
*Scarlet Fever in Schoolrooms*  
*Serological Types of Hemolytic Streptococci Isolated*

<i>Schoolroom</i>	<i>Population</i>	<i>No. Cases of Scarlet Fever</i>	<i>Time Range in Days 1</i>	<i>Type of Hem. Streptococci</i>	<i>Attack Rate</i>
1 (Grade 5)	33	11	48	5	33.3
2 (Grade 1)	32	10 2	85	2	31.2
3 (Grade 1)	36	12	76	1	33.3
4 (Grade 1)	42	6 2	30	2 s	14.3
5 (Grade 6)	38	5 2	49	2	13.2
6 (Grade 5)	44	9 2	23	2 s	20.2
Total	225	53			23.5

1. Interval between onsets, first and last case

2. One case of sore throat in addition to scarlet fever

3. Also 2 cases Type 19 (Schoolroom 4), and 1 case Type 19 (Schoolroom 6), included in number of cases of scarlet fever

each school was one of several from which multiple cases of scarlet fever had been reported concurrently. The exception (No. 1) was in an elementary school with a total population of 495 children distributed among fourteen schoolrooms. In this school scarlet fever was reported from one room only.

Nose and throat cultures were taken of all children in each room at weekly intervals for periods varying from 4 to 10 weeks. A total of 900 cultures were obtained from 168 schoolroom contacts to 53 cases of scarlet fever and 4 cases of sore throat. As cases occurred, cultures were taken either at home or in the contagious hospital. When convalescent cases returned to school at the expiration of the isolation period their cultures were studied together with those obtained from the contacts; a total of 297 cultures were taken of the 57 cases. Whenever possible, cultures were obtained of the family contacts of the

fection. An attempt was made to account for all causes of absenteeism among the children. A record was kept of upper-respiratory infections. Whenever possible Dick tests were performed on the schoolroom contacts.

All nose and throat cultures were streaked on 5 per cent horse blood agar containing 0.5 mg. per cent paraminobenzoic acid.<sup>10</sup> Following incubation for 18-24 hours at 37° C., plates positive for beta-hemolytic streptococci were fished to beef infusion broth. All Lancefield Group A<sup>6</sup> hemolytic streptococci were classified as to serological type by the slide-agglutination method of Griffith.<sup>7</sup> Classification of self-agglutinating or granular cultures was facilitated by digestion with trypsin as described by Allison.<sup>11</sup>

RESULTS

A. Cases

A single serological type of hemolytic streptococci was isolated from the scarlet

fever cases occurring in each of four of the six schoolrooms (Table 1). In both of the remaining classrooms two serological types were involved. In schoolroom No. 4 there were 4 cases of Type 2 and 2 cases of Type 19, while in schoolroom No. 6 there were 8 cases of Type 2 and a single case due to Type 19. The latter infection was traced to a playmate, a recently recovered scarlet fever patient from whom Griffith Type 19 hemolytic streptococci were recovered.

Study of the distribution of cases according to time of onset revealed a range of from 23 days between the first and last case in schoolroom No. 6, to 85 days in schoolroom No. 2. In two small institutional outbreaks recently investigated by the authors, the range of onsets was 10 days in the first (14 cases in an orphanage), and 8 days in the second (11 cases in a home for blind children). Apparently the interval between cases in this type of institution tends to be less than in a schoolroom. Similarly, in family units, the majority of cases have their onset within a relatively short space of time. In this sense, environmental factors in the home as they relate to the spread of scarlet fever appear to be similar to those in an institution in which children live in close proximity to each other.

The attack rates in the six schoolrooms varied from 13 to 33 per cent (Table 1). Among the total population

of 225 children, 53 or 23 per cent, developed scarlet fever. The similarity in the individual attack rates is even more apparent when the computations are based upon the number of Dick-positive children rather than on the total population. These attack rates ranged from 24 to 41 per cent (Table 2).

It will be noted (Table 2) that the figures for the number of Dick-positive children have been adjusted to correct for the few contacts whose Dick status was not known. This was done by assuming that the percentage of positives among the untested children was the same as that observed in the tested group. Statistical analysis of both sets of attack rates revealed no significant differences among them, suggesting that the risk of acquiring scarlet fever was equally great in all six rooms.

The adjusted figures also were used in computing the ratio of scarlet fever cases to Dick-positive children. There appeared to be a fairly constant relation between these two variables in each schoolroom (Table 2). The ratios of cases to Dick-positives varied from 1:2.4 to 1:4.2 with a mean of 1:3. The results were not altered materially when the observed rather than the adjusted number of Dick-positives was used in computing the ratios.

The ratio of cases to Dick-positives in the two institutional outbreaks previously mentioned was 1:2.3 and 1:2.8

TABLE 2  
*Scarlet Fever in Schoolrooms*  
*Attack Rates Among Dick-Positive Children*

Schoolroom	Population	Dick Tests				Corrected No. Dick- Positives	Corrected Attack Rate	Corrected Ratio—Cases: Dick-Positives
		No. Tested	No. Unknown	No. Dick- Positive	% Dick-Positive in Tested Group			
1	33	31	2	25	80.6	27	40.7	1:2.4
2	32	27	5	25	92.5	30	33.3	1:3.0
3	36	27	9	25	92.5	33	36.3	1:2.7
4	42	32	10	16	50.0	21	28.6	1:3.6
5	38	32	6	18	56.2	21	23.8	1:4.2
6	44	38	6	23	60.5	27	33.3	1:3.0
Total	225	187	38	132	70.5	159	33.3	1:3.0

Corrected attack rates derived from: Cases/Dick-Positives  
Dick-Positive totals include cases

respectively. Despite differences in distribution by time of onset of the cases in the schoolrooms and the two institutional outbreaks, approximately one-third of the exposed Dick-positive children came down with scarlet fever. During the period of observation only 4 (0.66 per cent of the Dick-negative children) manifested evidence of streptococcal infection other than scarlet fever due to the serological type involved in each classroom. Considering the high scarlet fever attack rates in the individual rooms, the latter figure seems surprisingly low.

### B. Contacts

1. *Schoolroom Contacts*—The carrier rates for all serological types of hemolytic streptococci throughout the entire period of observation were high; varying from 28 to 91 per cent in the individual schoolrooms. However, except for one schoolroom (No. 1) the number of contacts who harbored the etiological type in each room was small, from 1 to 4 children (Table 3). In schoolroom No. 1, 10 of 22 healthy contacts

the serological type of hemolytic streptococci which was responsible for scarlet fever cases in a particular classroom for more than 4 weeks. However, many of the convalescent cases continued to have positive cultures for 2 and even 3 months. At times a non-disease producing type of hemolytic streptococci was more widespread among the contacts in an individual schoolroom than the organism which was causing scarlet fever. Dick status did not appear to affect the duration of the carrier state in the healthy child.

Of the 168 pupil contacts of the 53 cases of scarlet fever 106 (63.1 per cent) had positive Dick tests. Although 11 (10.3 per cent) of these harbored the serological type of hemolytic streptococci involved in the particular schoolroom, they did not develop scarlet fever.

2. *Family Contacts*—Study of 78 family contacts of the 53 cases revealed that 43 (55.2 per cent) harbored the serological type of hemolytic streptococci which had been incriminated in the respective classroom (Table 4). There were 19 secondary cases among

TABLE 3  
Scarlet Fever in Schoolrooms  
Spread of Etiological Types Among Contacts

Schoolroom	No. Contacts *	Total No. Cultures	No. Positive for Hem. Streptococci (all types)	Per cent Positive	No. Positive for Etiological Types:			
					1st Week	%	Total Period	%
1	22	220	20	90.9	10	45.4	10	45.4
2	21	84	8	38.9	1	4.8	4	19.0
3	24	96	11	45.8	2	8.3	3	12.5
4	35	140	12	34.3	1	2.8	1	2.8
5	32	224	16	50.0	1	3.1	2	6.2
6	34	136	9	26.5	2	5.9	4	11.7
Total	168	900	76	45.2	17	10.1	24	14.3

\* Total population less scarlet fever and sore throat cases

had cultures positive for Griffith Type 5 hemolytic streptococci. Ventilation studies in this room revealed that 20 per cent of the air was being recirculated through a heating-ventilating unit. This factor may have been responsible for the widespread dissemination of the organism in this room.

Of the healthy children, none carried

these family contacts, giving a secondary attack rate of 35.8 per cent. In each instance the serological type of hemolytic streptococci isolated from the secondary case was the same as that causing scarlet fever in the corresponding schoolroom.

A significantly greater proportion of the healthy family contacts (24 or 40.7

TABLE 4

*Scarlet Fever in Schoolrooms  
Family Contacts and Secondary Cases*

Schoolroom	No. Primary Cases	Family Contacts			Other Serological Types Producing Scarlet Fever in Community at Time *
		No. Studied	No. Positive for Etiological Type	No. Secondary Cases	
1	11	20	13 (Type 5)	5	2, 1, 6
2	10	18	11 ( " 2)	2	17-23, 8, 6, 2, 1
3	12	3	2 ( " 1)	5†	2, 1, 8, 6, 19/24
4	4	6	3 ( " 2)	2	19/24, 1, 17/23
5	5	9	8 ( " 2)	4	19/24, 1, 17/23
6	8	22	6 ( " 2)	1	19/24, 1, 17/23
Total	50‡	78	43 (55.2%)	19 (24.3%)	

\* Strains isolated in order of frequency during course of schoolroom outbreak

† Only 2 cases studied bacteriologically

‡ Three Type 19 cases not included since family contacts not studied

per cent of 59) than the schoolroom contacts (24 or 14.3 per cent of 168) had nose and throat cultures positive for the serological type of hemolytic streptococci producing scarlet fever. This suggests greater dissemination of the infecting organism in the family than in the schoolroom.

#### CONTROL MEASURES

In four of the schoolrooms the outbreaks subsided spontaneously. There was no intervening vacation period which might have interfered with the spread of scarlet fever. Control measures were attempted in two of the schoolrooms. In schoolroom No. 1, the noses and throats of contacts were sprayed with Pickrell's Solution (2½ per cent sulfadiazine in a solution of ethanolamines) twice daily for 2 weeks as a prophylactic measure.<sup>12</sup> However, it is questionable whether this procedure influenced the course of the outbreak.

In schoolroom No. 6 both cases and contacts whose nose and throat cultures were positive for the etiological type of hemolytic streptococci were excluded from school until their cultures became negative. The duration of the outbreak—interval between the first and last case (Table 1)—was 23 days, only slightly less than that of the outbreak in schoolroom No. 4 which subsided in 30 days without control measures.

#### DISCUSSION

When multiple cases of scarlet fever occur in a schoolroom, a single serological type of hemolytic streptococci is usually the etiological agent. Should two types appear concurrently, one or the other will predominate ultimately. This type predominance exists in the schoolroom despite the occurrence throughout the community of scarlet fever due to a variety of serological types. The schoolroom outbreaks in this respect are analogous to those in institutions<sup>13</sup> and in families.<sup>14</sup>

The frequent occurrence of multiple cases caused by the same organism is further evidence that the schoolroom is a significant factor in the epidemiology of scarlet fever. The transfer of infection to pupil contacts and family contacts tends to maintain lines of spread. The high attack rates, both in the schoolroom and in the family, indicate how readily dissemination may take place.

Outbreaks of streptococcal infection in institutions usually can be traced to the introduction of a single serological type of hemolytic streptococci not previously present in the population.<sup>15</sup> The recovery of the same serological type from multiple cases of scarlet fever in the same household<sup>14</sup> and in schoolrooms suggests a similar series of events.

Utilizing serological classification as

an aid in epidemiological investigation, it is possible to trace chains of spread in basic population units. In the outbreaks reported here, it was found that convalescent carriers and missed cases constitute a significant source of infection. With but few exceptions, it was noted that convalescent cases, upon their return to school at the expiration of the isolation period, still harbored the infectious agent in the nose and throat.

As pointed out by Darling and Gordon,<sup>16</sup> the problem of hemolytic streptococcus "carriers" is confused by using the word to include (a) the so-called healthy carrier, (b) the subclinical or missed case, and (c) the convalescent case. In the past the significance of the subclinical or missed case and the convalescent case has been minimized, while the rôle of the "healthy carrier" as a potential source of infection may have been overemphasized. The term "healthy carrier" often included individuals who more properly should have been considered in one of the other categories.

In attempting to relate carrier rates prevailing in a community to the occurrence of an epidemic, it is important that those actually infected be distinguished from the temporary "healthy carrier." When this is done, there actually is little but empirical evidence to support the view that an increased carrier rate precedes the appearance of cases.<sup>17</sup>

There was no rise in the carrier rate when cases began to appear in the outbreaks of streptococcal pharyngitis reported by Bloomfield and Felty.<sup>18</sup> Kuttner<sup>15</sup> found that major outbreaks of streptococcal infections usually are not caused by streptococcal carriers already present in the community.

Similarly, in the studies reported here, there were remarkably few carriers of the epidemic type of hemolytic streptococci in each of the schoolrooms except

among those children who could be classified as missed or convalescent carriers. In a previous experience with an outbreak in a small country orphanage, the population became saturated with the scarlet fever producing type of hemolytic streptococci in a relatively short time. However, as regards the relationship between case and carrier, cause could not be distinguished from effect.

The absence of streptococcal disease, other than scarlet fever, was a striking characteristic of these schoolroom outbreaks. Griffith<sup>8</sup> reported a high incidence of scarlet fever in schools where other streptococcal disease due to the same type of hemolytic streptococci also was prevalent. On the other hand, the reverse (high scarlet fever attack rates with low rates for other streptococcal infections) also has been reported.<sup>19</sup>

The Dick-negative children in the six schoolrooms remained relatively free of streptococcal infection. Further studies are essential to determine whether or not this was a chance finding in a relatively small sample. If, in a larger series of schoolroom studies, it is found that Dick-negative children succumb to streptococcal infections other than scarlet fever as frequently as Dick-positive children to scarlet fever, then the dispute concerning the efficacy of immunization with the Dick toxin could be clarified. On the other hand, if such research proves that large numbers of Dick-negative children regularly escape infection during streptococcal outbreaks in which scarlet fever predominates, a new significance could be given to immunization with Dick toxin as a method of controlling schoolroom scarlet fever, with consequent reduction in absenteeism.

The percentage of Dick-positive children in each schoolroom (Table 2) varied considerably in the six classrooms. It will be noted that there were

more Dick-positives among some of the older children than among the younger ones. Anderson<sup>20</sup> noted that the percentage of Dick-positives in any given age group is influenced by the characteristics of the community from which the sample is drawn; rural or semi-rural populations yield a higher percentage of Dick-positives than urban populations with the same age distribution.

As Schwentker, Janney, and Gordon point out,<sup>21</sup> only a proportion of those who acquire the epidemic strain during an outbreak of streptococcal disease become clinically ill. The available data indicate the existence of some unknown factor which protects a certain proportion of those exposed irrespective of Dick status. It will be recalled that of the 225 children studied, 159 (70.7 per cent) had positive Dick tests. Among this group there were 106 who escaped the infection. Of these, 11 (10.3 per cent) children harbored the same serological type of hemolytic streptococci that was producing scarlet fever in other susceptibles.

It is expected that further study along the lines indicated in this report may aid in solving some of the problems concerning streptococcal disease. Because the schoolroom is a ready source of streptococcal infection, it demands an increasing degree of attention in future research.

#### SUMMARY

1. Study of multiple cases of scarlet fever in six schoolrooms located in four different communities revealed a predominant type of hemolytic streptococci as the etiological agent in each classroom.

2. In four classrooms a single type of hemolytic streptococci was isolated from all cases occurring in each room while from both of the remaining rooms only two types were recovered.

3. Of the total population of 225 children in the six schoolrooms, 53 (23 per cent) developed scarlet fever. Individual attack rates in each classroom ranged from 13 to 33 per cent, while the ratio of scarlet fever cases to Dick-positive children varied from

1:2.4 to 1:4.2, with a mean of 1:3. Of the remaining Dick-positives 11 (10.3 per cent) harbored the serological type of hemolytic streptococci producing scarlet fever in other children but did not develop clinical symptoms.

4. During the course of the study the incidence of other streptococcal disease due to the serological type of hemolytic streptococci producing scarlet fever in the respective schoolrooms was 0.66 per cent.

5. In five of the schoolrooms only a small number of contacts became carriers of the etiological type. In the sixth classroom the etiological type was isolated from the noses and throats of 10 of 22 healthy children. This room was using recirculated air.

6. Study of 78 family contacts of 53 scarlet fever cases revealed that 43 (55.2 per cent) harbored the same serological type of hemolytic streptococci which had been incriminated in the respective schoolrooms. There were 19 secondary cases among these family contacts, giving a secondary attack rate of 35.8 per cent.

7. There was significantly greater dissemination of the etiological types among the family contacts than among the schoolroom contacts of the cases in each schoolroom.

8. Control measures were instituted in two of the schoolrooms. Prophylactic application of a sulfonamide spray was utilized to protect the contacts in one schoolroom and exclusion from school of cases and contacts harboring the etiological type was tried in the other. Although no further cases appeared in either of these schoolrooms it is questionable whether or not this was a direct result of the control measures. The four remaining outbreaks subsided spontaneously.

9. The frequent occurrence of multiple cases of scarlet fever due to a predominant type of hemolytic streptococci in schoolrooms, and the subsequent transfer of infection to the family contacts, is further evidence of the significance of the schoolroom in the transmission of scarlet fever.

#### REFERENCES

1. Chapin, C. V. The Spread of Scarlet Fever and Diphtheria in Schools. *A. J. Pub. Hyg.*, 20:813, 1910.
2. Wilson, E. B., Bennett, C., Allen, M., and Worcester, J. Measles and Scarlet Fever in Providence, R. I. *Proc. Amer. Phil. Soc.*, 80:357, 1939.
3. Wells, W. F., Wells, M. W., and Wilder, T. S. The Environmental Control of Epidemic Contagion. 1. An Epidemiologic Study of Radiant Disinfection of Air in Day Schools. *Am. J. Hyg. (Sect. B)*, 35:97, 1942.
4. Robertson, O. H., Bigg, E., Puck, T. T., and Miller, B. J. The Bactericidal Effect of Propylene Glycol Vapor on Microorganisms Suspended in Air. *J. Exper. Med.*, 75:593, 1942.
5. Kuttner, A. G., and Reyersbach, G. The Prevention of Upper Respiratory Infection and Rheumatic Recurrences in Rheumatic Children by the

Prophylactic Use of Sulfanilamide. *J. Clin. Investigation*, 22:77, 1943.

6. Lancefield, R. C. A Serological Differentiation of Human and Other Groups of Hemolytic Streptococci. *J. Exper. Med.*, 57:571, 1933.

7. Griffith, F. F. The Serological Classification of *Streptococcus Pyogenes*. *J. Hyg.*, 34:542, 1934.

8. Griffith, F. F., in Epidemics in Schools. *Spec. Rep. Series No. 227*, Medical Research Council, 1938.

9. DeWaal, H. L. A Study of the Serological Types of Hemolytic Streptococci in Relation to the Epidemiology of Scarletina and Other Infections Due to These Organisms. *J. Hyg.*, 41:65, 1941.

10. Janeway, C. A. A Method for Obtaining Rapid Bacterial Growth in Cultures from Patients under Treatment with Sulfonamides. *J.A.M.A.*, 116:941, 1941.

11. Allison, V. D. Unpublished Data. Cited in Studies on Hemolytic Streptococci, by Rudd, G. V., White, C., and Ward, H. K. *Australian J. Exper. Biol. & M. Sc.*, 17:26, 1939.

12. Rubenstein, A. D., and Foley, G. E. The Effect of Chemotherapy on the Duration of the Carrier State Following Scarlet Fever. *New England J. Med.*, in press.

13. Kuttner, A. G., and Krumwiede, E. Observations on the Effect of Streptococcal Upper Respiratory Infection on Rheumatic Fever: A Three Year Study. *J. Clin. Investigation*, 20:273, 1941.

14. Foley, G. E., Wheeler, S. M., and Aycok, W. L. The Serological Types of Hemolytic Streptococci

Isolated from Multiple Cases of Scarlet Fever in the Same Households. *A.J.P.H.*, 34:1083, 1944.

15. Kuttner, A. G., and Krumwiede, E. Observations on the Epidemiology of Streptococcal Pharyngitis and the Relation of Streptococcal Carriers to the Occurrence of Outbreaks. *J. Clin. Investigation*, 23:139, 1944.

16. Darling, G. B., and Gordon, J. E. American Administrative Practice in the Control of Scarlet Fever. *J. Prev. Med.*, 6:185, 1932.

17. Schwentker, F. F. Survey of Hemolytic Streptococci in Certain Army Camps. *Army Med. Bull.*, 65:94, 1943.

18a. Bloomfield, A. L., and Felty, A. R. On the Mode of Spread of an Outbreak of Acute Tonsillitis. *Bull. Johns Hopkins Hosp.*, 34:393, 1923.

18b. ——— Definition of Hemolytic Streptococcus Parasitism in the Upper Air Passages of Healthy People. *Arch. Int. Med.*, 32:386, 1923.

19. Medical Research Council. Streptococcal Sore Throats at Springfield Park School, Horsham. *Month. Bull., Emergency Pub. Health Lab. Service*, Dec. 4, 1941.

20. Anderson, G. W. Studies on Resistance to Scarlet Fever. Thesis submitted to the faculty of the Harvard School of Public Health in partial fulfillment of the requirements for the degree of Doctor of Public Health, 1941.

21. Schwentker, F. F., Janney, J. H., and Gordon, J. E. The Epidemiology of Scarlet Fever. *Am. J. Hyg.* (Sect. B), 38:27, 1943.

# Infant Mortality in Relation to Month of Birth

PARIS R. EASTMAN

*Metropolitan Life Insurance Company, New York, N. Y.*

THE problem of infant mortality has been studied intensively during recent decades but one phase of the subject still lacks adequate investigation. This concerns the influence that season of birth has on the chance of survival to the first birth anniversary. Hitherto, attempts to study this relationship have been confined largely to computations based on the number of deaths under 1 year of age in a given month related to the number of live births reported in that same month. Obviously, this method is little more than a makeshift, since babies dying under 1 year in any calendar month have been born at various times during the preceding year, and so have a limited relationship to the births recorded in that month. The correct approach to the problem is to trace the deaths that actually occurred among a group of babies born in a specified month. In this way it is possible to discover not only the most favorable birth month from the standpoint of survival to the first birthday, but also to learn how this chance of survival is affected by certain diseases and conditions that accompany the cyclic round of the seasons.

Until recently, the basic data for such a study were not available in published reports of vital statistics. The U. S. Bureau of the Census *Annual Reports of Births, Stillbirths and Infant Mortality* for the years 1935 to 1937, however, contain certain statistical material that helps to supply this want. In the appendix to this article will be found a full description of this material and the

manner in which it has been utilized in the construction of the accompanying tables. These tables will show, first, the mortality from all causes in the first year of life among infants born in each month of the year during the period 1935 to 1937, and then in greater detail the principal causes of death and some of the factors involved.

Table 1 exhibits for children born in each calendar month, the mortality from all causes combined at each successive month of age. That the season of birth is definitely related to the subsequent health of babies is here clearly apparent. A glance at the table shows that August babies have the best chance of surviving to their first birthday, while next in order are those born in September and July. The least favorable months of birth are January, December, and February. Babies born in January suffer a mortality rate in their first year about 15 per cent greater than August babies.

This is chiefly due to the very high mortality of January infants in the first 4 months of life. The winter months are especially severe on very young babies. If, however, the January child manages to survive the rigorous conditions of winter and early spring, his health outlook for the balance of his first year of life compares favorably with that of babies born in other seasons who have reached the age of 4 months. In fact, the January infant of that age has a distinctly better prospect of celebrating his first birthday than has a 4 months old child born in August. The reason for this is that the January child,



TABLE 1

*Death Rates from All Causes per 100,000 at Specified Ages among Infants Born in Each Calendar Month—United States. 1935–1937 Inclusive*

Age at Death in Months	Month of Birth											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Total Under 1 Year	6,011	5,766	5,459	5,560	5,476	5,496	5,303	5,214	5,258	5,441	5,650	5,894
Months Under 1	3,513	3,443	3,315	3,366	3,303	3,193	3,051	2,881	2,846	3,049	3,176	3,420
1	631	506	428	394	361	375	350	376	425	422	523	589
2	422	354	294	327	305	298	312	360	359	408	455	441
3	306	264	244	269	248	280	290	294	338	357	361	314
4	219	240	237	218	229	264	245	259	285	279	243	227
5	199	215	199	191	210	209	215	237	232	208	195	191
6	203	182	167	188	174	199	223	220	195	169	164	197
7	159	153	147	139	165	201	194	171	153	142	165	168
8	141	138	122	150	170	189	150	148	146	161	151	153
9	128	113	124	157	159	151	140	133	138	139	131	128
10	103	116	140	138	130	120	115	120	130	107	104	99
11	103	149	137	123	119	116	115	112	111	104	93	84

having survived the rigors of winter and spring, faces relatively healthful conditions for the rest of the year, whereas the August baby of 4 months is only just about to encounter the very conditions that have been a hazard to the early life of the January baby.

As a general rule, the mortality of infants decreases with each successive month of age. The decline, however, tends to be interrupted or retarded when the children encounter the trying conditions of winter. February babies, for example, show a rise in mortality at 10 months of age; March infants at 9 months; April infants at 8 months, etc., up to those born in July who show an increase in mortality at the age of 6 months. The pertinent figures have been printed in bold face type in the table and are seen to run essentially in a diagonal direction from left to right. They show that in December, with the approach of winter, the infant death rate rises among children born in the first half of the year. Among babies born in August and later months, no such rise in mortality is recorded with the advent of winter but the decline which would ordinarily occur with increased age is very much slowed down. A similar trend, although to a much less extent, is discernible when the child

encounters the gastrointestinal diseases of summer. Note that the October child at 8 months; the November child, at 7 months; and December and January infants at 6 months, all show temporary rises in mortality early in the following summer.

ANALYSIS BY CAUSE OF DEATH

It is clear that season of birth has a decided bearing on the subsequent health of infants and their chance of surviving the first year of life. The question naturally arises—what are the diseases and conditions chiefly involved in this relation?

The principal causes of infant mortality may for our present purpose be broadly classified into 5 groups, namely:

1. The prenatal causes, which comprise premature births, congenital malformations and congenital debility.
2. The natal and neonatal group, which includes injury at birth and "other diseases peculiar to early infancy."
3. The respiratory diseases, chiefly influenza and pneumonia.
4. The gastrointestinal group, which covers diarrhea and enteritis, dysentery and "other diseases of the stomach."
5. All other diseases and conditions; among which the more important are whooping cough, syphilis, accidents, and those of ill-defined origin.

## PRENATAL CAUSES

Chief among the causes of infant mortality are those of prenatal origin. Of infant deaths from prenatal causes about 70 per cent are chargeable to premature birth, 21 per cent to congenital malformation, and 9 per cent to congenital debility. Babies born in winter and spring show the highest death rate from these causes and, to a large degree, this reflects the harmful effects on both mother and unborn child of the diseases most prevalent in winter. The effect is seen not only in the seasonal mortality due to premature birth and congenital causes but also in the seasonal distribution of stillbirths. The ratio of stillbirths to live births is about 12 per cent greater in spring than it is in mid-summer. Thus, in 1935-1937 the seasonal ratio of stillbirths per 1,000 live births was as follows:

<i>Stillbirths per 1,000 Live Births</i>			
January	36.0	July	32.9
February	35.5	August	31.9
March	35.7	September	32.3
April	36.1	October	34.1
May	36.2	November	35.1
June	35.0	December	33.9

Probably no single circumstance is responsible for this phenomenon but a controlling factor would seem to be the health hazards of winter and early spring for pregnant women. That weather conditions at this time of the year do seriously impair the health of expectant mothers is clearly indicated by the seasonal mortality from puerperal causes. During the period under study, 1935-1937, maternal mortality rates per

10,000 total deliveries averaged about 28 per cent higher during the first 4 months of the year than in the 4 months of August, September, October, and November.

Winter is the season when most of the communicable diseases reach their highest prevalence, particularly those which attack the respiratory system. The presence of an epidemic of even mild influenza is inevitably accompanied by an increase in deaths from all types of pneumonia. "Past experience has demonstrated that influenza is especially hazardous for the parturient, and a decided tendency to early miscarriage, in the course of an influenza, has a most serious effect in increasing the deaths from the respiratory infections."<sup>1</sup>

During attacks of influenza in pregnant women, according to Adair, the gestation is interrupted spontaneously in from 35 to 60 per cent of all the cases. "Most of the interruptions take place during the later months, especially near term. When pneumonia complicates gripe, the termination of pregnancy is much more frequent than otherwise."<sup>2</sup> It is not surprising, therefore, that the rates of stillbirths and infant deaths due to premature birth are particularly high during the early months of the year when the respiratory infections are at their peak. Since premature births dominate in the group of prenatal causes, any seasonal factor that would tend to increase appreciably the number of premature births would have con-

TABLE 2

*Death Rates from Prenatal Causes \* per 100,000 at Specified Ages among Infants Born in Each Calendar Month—United States. 1935-1937 Inclusive*

<i>Age at Death in Months</i>	<i>Month of Birth</i>											
	<i>Jan.</i>	<i>Feb.</i>	<i>Mar.</i>	<i>Apr.</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>
Total Under 1 Year	2,252	2,224	2,184	2,326	2,396	2,321	2,191	2,053	2,017	2,101	2,204	2,283
Under 1 Month	1,975	1,948	1,941	2,050	2,128	2,027	1,905	1,787	1,733	1,849	1,947	2,027
1 Month	111	100	88	93	88	100	101	97	118	95	100	96
2 Months	49	54	44	59	62	58	62	64	56	55	52	49
3 Months	34	36	30	39	34	41	38	32	36	32	31	33

\* Premature Birth, Congenital Malformation and Congenital Debility

NOTE: The table has not been carried beyond the age of 3 months because the figures for older ages are too small to be significant.

siderable weight in raising the mortality from prenatal causes generally.

Since 1935-1937, the period of this study, the treatment of pneumonia has been revolutionized by the new sulfa drugs and by penicillin. At present there are no data that enable us to measure the indirect effect of this new therapy on maternal and infant mortality. The interval since 1937, however, has been marked by significant gains in both of these fields and it would not be surprising to learn that a substantial part of these gains were attributable to this new treatment.

There is another factor that may play an important part in raising the mortality from the prenatal causes during the winter and spring months. Recent investigation seems to indicate that faulty nutrition in expectant mothers tends to increase the number of abor-

NEONATAL CAUSES

About 70 per-cent of all infant deaths from neonatal causes are attributable to injuries at birth. Consequently, we can hardly expect to find marked seasonal variation in this group of causes. Nevertheless, babies born in summer do have a better chance of escaping the hazards of birth than do those born in winter. According to Table 3, September babies suffer a neonatal death rate of 592 per 100,000 as compared with a rate of 682 for January infants. It is unthinkable that obstetricians are less skillful or more careless in winter than in summer. Perhaps the explanation lies in the fact that a substantial proportion of deaths due to injury at birth (about 28 per cent) are among premature infants; and prematurity, we have seen, is more frequent in winter than in summer.

TABLE 3

Death Rates from Natal and Neonatal Causes \* per 100,000 at Specified Ages among Infants Born in Each Calendar Month—United States. 1935-1937 Inclusive.

Age at Death in Months	Month of Birth											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Total Under 1 Year	682	676	660	653	638	632	639	593	592	619	623	677
Under 1 Month	670	660	646	643	629	624	629	582	583	605	609	661

\* Injury at Birth and "Other Diseases Peculiar to Early Infancy"  
NOTE: The table has not been carried beyond the age "under 1 month" for the reason that figures for older ages are insignificant.

tions, premature births, and malformed offspring. It is probably that in many sections of the country, particularly in the rural areas, the diet available in winter and spring is inferior to that enjoyed at other seasons of the year. In such sections, the lack of riboflavin and other essential elements in the winter diet of expectant mothers may be partly accountable for the rise in prenatal deaths in April and May.

The preponderance of premature births in this group of causes is indicated by the large proportion of deaths in the first month of life, 88 per cent of those dying under 1 year of age.

RESPIRATORY DISEASES

The respiratory diseases, chiefly influenza and pneumonia, are a concomitant of cold and unsettled weather and are particularly fatal to very young children. It is not surprising, therefore, to find that January babies suffer excessive mortality from these diseases, especially in the first 4 months of life. As the weather becomes milder the respiratory death rate declines, reaching its lowest point at each month of age in mid-summer. With the reapproach of winter it rises again, attaining a peak in January. For example, December babies suffer their highest mortality from

TABLE 4

*Death Rates from Respiratory Diseases \* per 100,000 at Specified Ages among Infants Born in Each Calendar Month—United States. 1935-1937 Inclusive*

Age at Death in Months	Month of Birth											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Total Under 1 Year	1,138	964	804	784	728	775	804	872	934	1,000	1,085	1,085
Months Under 1	317	281	204	165	108	85	80	74	92	127	169	215
1	274	177	127	94	56	44	39	48	80	118	201	214
2	187	136	75	55	36	34	41	83	107	166	221	214
3	126	79	48	35	31	46	67	100	152	181	185	144
4	65	45	29	27	33	55	78	119	151	144	115	96
5	31	29	24	30	48	72	101	134	125	104	82	62
6	24	24	28	46	65	98	130	122	96	74	47	35
7	20	21	34	55	81	110	114	88	64	46	29	22
8	19	32	46	76	97	97	78	63	48	27	18	20
9	29	40	66	90	89	78	59	40	23	16	18	19
10	34	58	77	82	63	52	32	21	17	17	18	22
11	50	74	74	59	51	37	18	14	14	17	21	31

\* Influenza and Pneumonia (all forms)

these diseases at 1 month of age, that is, in January; November babies' highest death rate is reached at 2 months of age; October babies at 3 months, etc. It is interesting to observe that this January peak becomes progressively lower with the advanced age of the children that have survived to that month. This can be seen by reading diagonally downward from right to left. The January peak among December infants is 244 per 100,000; among November infants, 221; among October babies, 181; and so on down to 110 among June children at the age of 7 months.

The May baby experiences the lowest mortality from the respiratory diseases chiefly because it faces at birth a

season when these diseases are at a minimum and so it is not much subject to influenza or pneumonia infection until the following winter when it has attained an age at which it is better constituted to withstand this hazard.

The relation of season to the mortality from respiratory disease in infancy is well illustrated by Table 4A. It is designed to show the mortality, not among infants born in each of the specified months, as presented in the other tables of this study, but among those living at each age period in January and August respectively. In the first place, it is clear, the younger the child, the greater is the risk of death from these diseases. In the second place the mortality in August from respiratory affec-

TABLE 4A

*Comparison of the Age Specific Death Rates per 100,000 from Respiratory Diseases among Children Living at Each Month of Age in January and in August—1935-1937*

Age	January	August	Per cent
Months			August of January
Under 1	317	74	23.3
1	244	39	16.0
2	221	34	15.4
3	181	31	17.1
4	151	27	17.9
5	134	24	17.9
6	130	24	18.5
7	110	20	18.2
8	97	20	20.6
9	90	18	20.0
10	77	17	22.1
11	74	14	18.9

tions seldom rises above one-fifth of that recorded in January in the corresponding age group. Similar comparisons for other months can be made by returning to Table 4 and following the procedure described above, that is, by reading diagonally downward from right to left, beginning with the month chosen for comparison. It will be noted that in any particular calendar month, the respiratory diseases are most fatal among the new-born infants and become less so with each added month of age.

#### GASTROINTESTINAL DISEASES

Although in general the mortality of infants is highest among the new-born and decreases with each added month of age, the rule is inapplicable to the gastrointestinal group of diseases, particularly at certain seasons of the year. Excepting those born in September and October, the peak of mortality comes, not in the first month of life but at later ages when the child becomes exposed to the epidemic form of diarrhea and enteritis in the warm months of the year. But even in such months as June, July, and August, when these diseases are at their height, the greatest mortality is not registered among very young infants but among those 2 to 3 months of age. Apparently the new-

born receive certain protection not afforded those of older age. Since these digestive disorders are primarily due to faulty feeding, the logical explanation of the relative immunity enjoyed by the new-born baby lies in breast feeding. A month or two later in life, when he is weaned or begins to receive supplemental food, he becomes more susceptible to the gastrointestinal diseases. This is why babies born in July and August exhibit the highest mortality from these diseases, not in July and August when these diseases are most prevalent, but in September and October after the seasonal peak has passed, and why it is not among babies born in summer that we find the greatest mortality from these disorders but among those born earlier in the year, in April, May, and June. The October or November baby stands the best chance of escaping death from the digestive diseases because he does not encounter them to any marked degree until the following summer when he will be 7 or 8 months old and his feeding habits have become more or less established.

The seasonal character of the gastrointestinal diseases is well shown in Table 5A. As in Table 4A this table shows not the mortality among babies

TABLE 5

*Death Rates from Gastrointestinal Diseases\* per 100,000 at Specified Ages among Infants Born in Each Calendar Month—United States. 1935-1937 Inclusive*

Age at Death in Months	Month of Birth											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Total Under 1 Year	628	634	630	635	635	653	599	601	581	556	554	594
Months Under 1	63	55	62	66	66	86	87	89	94	88	64	72
1	47	48	51	63	79	103	95	106	93	64	51	49
2	38	43	53	96	113	110	111	109	71	44	37	34
3	39	58	87	105	111	111	98	64	37	33	25	33
4	57	96	112	95	103	100	57	32	27	25	25	29
5	88	102	96	85	79	53	25	21	20	21	30	56
6	97	88	77	73	40	19	19	20	24	26	59	88
7	82	74	54	30	17	16	16	18	21	41	77	84
8	68	50	26	16	12	16	13	23	38	78	72	72
9	48	22	14	11	12	15	19	38	63	64	61	59
10	21	11	11	10	11	17	31	53	64	50	48	29
11	10	15	13	10	16	31	49	49	50	41	30	16

\* Diarrhea and Enteritis, Dysentery and "Other Diseases of the Stomach"

TABLE 5A

*Comparison of the Age Specific Death Rates per 100,000 from Gastrointestinal Diseases among Children Living at Each Month of Age in January and in July—1935-1937*

Age Months	January	July	Per cent January of July
Under 1	63	87	72.4
1	49	103	47.6
2	37	113	32.7
3	33	105	31.4
4	27	112	24.1
5	21	102	20.6
6	19	97	19.6
7	16	84	19.0
8	12	72	16.7
9	11	64	17.2
10	11	64	17.2
11	15	49	30.6

born in the specified months but among those living in those months.

The age distribution of the mortality from the digestive disorders recorded in January follows the established order but that for July is much distorted, showing a peak not among the new-born but at the age of 2 months. January babies under 1 month of age die at a rate 72 per cent of that recorded in July for infants of that age. At 2 months of age the January mortality rate is less than one-third of that for July, while at 8 months of age it is only one-sixth of the July rate.

#### ALL OTHER CAUSES

This class comprises a wide variety of conditions, the chief component being a group reported under the general designation of "Unknown or Ill-defined Causes." It includes such other causes as accidents, whooping cough and other

communicable diseases of childhood, syphilis, tuberculosis, etc. With such a heterogeneous group one would not expect to find clearly defined seasonal or age distribution patterns. Yet here again the lowest mortality rates are found among May, July, and August babies, and the highest among those born in December, January, and February. Also, consistently high death rates prevail among those under 1 month of age with gradually reduced rates in each of the next 3 months of life. The mortality of winter new-born infants is much higher than those born in summer. February children, for example, succumb to these causes in the first month of life at a rate 45 per cent greater than children born in September. In the later months of the first year of life, there are no very definitely ordered differentials, and Table 6 accordingly is carried out only for the first 3 months.

TABLE 6

*Death Rates from All Other Causes per 100,000 at Specified Ages among Infants Born in Each Calendar Month—United States, 1935-1937 Inclusive*

Age at Death in Months	Month of Birth											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Total Under 1 Year	1,312	1,266	1,180	1,162	1,079	1,115	1,070	1,096	1,135	1,165	1,184	1,255
Months												
Under 1	488	499	462	442	372	371	350	349	344	380	387	445
1	190	169	151	137	132	122	108	117	128	136	163	186
2	145	116	119	114	91	94	95	101	122	138	138	141
3	107	91	79	90	72	82	87	98	113	111	120	104

NOTE: The table has not been carried beyond the age of 3 months because the group is so heterogeneous that the figures for later ages have no significance.

## SUMMARY

To summarize—babies born in summer and early autumn have a distinctly better prospect of celebrating their first birthday than have those born at other times of the year. These summer and fall babies, for the most part, were conceived during October, November, and December of the preceding year, when their parents' health was at a peak following the beneficial effects of summer. It is therefore possible that as a class these babies are better endowed to survive the rigors and hazards of the first year of life than are those conceived in spring. But it would seem that the chief cause of the wide differences between the death rates of summer and winter babies is the seasonal distribution of the communicable diseases, particularly those that affect the respiratory system.

Not only are the respiratory diseases especially dangerous to very young babies, but through their deleterious effects on the health of expectant mothers they are no doubt also indirectly responsible for a large part of the excessive mortality among unborn infants during late winter and early spring, the season when these diseases are most prevalent. The infant born at this time of the year is not only more likely to be born dead and prematurely than the summer baby, but it also faces the special hazard of respiratory infection at an age when it is least able to resist it.

The summer child, in its first few months of life, also faces a special hazard—that of infantile diarrhea. But this disease, thanks to the remarkably successful campaign against it in recent years, is no longer the scourge of early infancy that it was only a few decades ago. Nowadays, its toll of infant life in the first few months is far less than that exacted by the respiratory diseases.

For future progress in the reduction of infant mortality, special effort, next

to prenatal care, should be devoted to the battle against the respiratory diseases, not only because of their direct threat to the new-born infant, but also for their prejudicial effect on the antepartal health of expectant mothers. Progress in this direction may well be expected through further developments in the field of chemotherapy.

One very fortunate circumstance in the present situation is the fact that the mortality from prenatal defects and the respiratory affections runs counter to the seasonal cycle of births; that in summer, when the birth rate is highest, the forces that tend to produce defective and nonviable offspring are the least active; and when these forces are at their maximum, they come at a season when fewer babies are exposed to them.

## APPENDIX

The data on which the study presented in the text is based were abstracted from General Tables 1, 10, and 20 in the *Annual Reports of Births, Stillbirths and Infant Mortality in the United States for the years 1935 and 1936*, and from General Tables 1, 8, and 22 in the *Annual Reports of Vital Statistics for the United States, Part I—Place of Occurrence, for the years 1937 and 1938*. Since the Bureau of the Census changed the form of the infant mortality table in subsequent reports, it was impossible to continue the study for more recent years.

These tables give the monthly incidence of live births and stillbirths, and the deaths from important causes, in each month of the year among infants in certain age subdivisions of the first year of life. By counting back, from the month of death, the number of months corresponding to the age at death, it was possible to allocate the deaths of the infants to their month of birth, and hence to reconstruct infant mortality tables according to the month of birth. For example, babies dying in

September under 1 month of age were considered as having been born in September; those dying at 1 month and under 2 months were tabulated as being born in August; those who were 2 months old and less than 3 months were listed as being born in July, and so forth. Of course, this method is not strictly accurate since, for example, a child 25 days old (under 1 month) dying on the 10th day of September would have been born on the 16th of August and not in September as arbitrarily tabulated. A similar remark applies also to each other age at death. However, greater refinement in determining the month of birth was not possible since the Census Bureau tables did not give the exact age (i.e., in days) at death. In the following discussion mention of the month of birth must accordingly be taken as only closely approximate.

After the deaths had thus been classified on the basis of the month of birth, death rates at each month of age were computed in the following manner:

For children who died in the first month of life, the death rate was based on the number who were born in the same month. This seemed to be the best procedure because the great majority of babies who fail to survive the first month of life, die within the first week and so are born within the calendar month of their death.

For children of older ages, the procedure was changed slightly. As already pointed out, not all infants who died at age 1 month were born within the calendar month immediately preceding the calendar month of death. A substantial proportion were born in the second preceding month. Accordingly, the death rate of babies aged 1 month was based on the average of the births in the preceding month and in the second preceding month.

The steps in the computation from this point on are best illustrated by means of an example. Thus, consider

the case for babies born in March. Since, in the months of March during the 3 year period, there were 18,680 deaths under 1 month of age and 563,547 live births, the mortality rate in the first month of life was  $3,315$  per 100,000 live births. This left, out of a cohort of 100,000 March babies starting from birth, 96,685 to enter into the second month of life.

Now, there were observed 2,264 deaths in the second month of life during the month of April, which contained 90 days for the 3 year period; the average daily deaths were thus  $2,264 \div 90$ . According to the assumption made, these deaths are to be related to an average of the births in February and March, numbering 541,007. In these 2 months, there were 178 days during the 3 year period (one was a leap year), or an average of 89 days per month. The average daily births then came to  $541,007 \div 89$ , and the deaths in the second month of life per 100,000 live births were

$$\frac{2,264}{90} \div \frac{541,007}{89} = 414 \text{ per } 100,000$$

Since 96,685 babies out of the cohort lived to enter the second month of life, the mortality rate (probability of death) in that month of age was

$$414 \div 96,685 = 428 \text{ per } 100,000$$

The number in the cohort left to enter the third month of life was  $96,685 - 414 = 96,271$ .

The records show that there were 1,600 deaths in the third month of life during May within the 3 year period, or an average daily rate of  $1,600 \div 93$ . In this way, it is found that the deaths in the third month of life per 100,000 live births were:

$$\frac{1,600}{93} \div \frac{541,007}{89} = 283 \text{ per } 100,000$$

The mortality rate (probability of



death) in the third month of age was, therefore,  $283 \div 96,271 = 294$  per 100,000.

The procedure for computing death rates for the later months of life then continues along the same lines. The mortality rate for any specified cause at any month of life was computed by applying the ratio of deaths from that cause to all causes within the month of age to the corresponding mortality rate from all causes.

In the assignment of the month of birth to infants recorded according to month of death and age at death, the approximate method set forth above was employed, since the "attained age" is given in the Census reports only to the nearest month. It would be desirable for similar studies to be made with more

exact assignment of the month of birth, if adequate data were obtainable.

#### REFERENCES

1. *Maternal Mortality in New York City*. The Commonwealth Fund, 1933, p. 107.
2. *White House Conference on Child Health and Protection*. Fetal and Maternal Morbidity and Mortality Committee on Prenatal and Maternal Care, Fred Lyman Adair, M.D., Chairman, p. 27. D. Appleton Century, 1933.

NOTE: The author is indebted to Mortimer Spiegelman for devising the foregoing procedure for the computation of the various death rates.\* Grateful acknowledgment is also made of the interest and helpful advice of Dr. Alfred J. Lotka and Herbert H. Marks.

\*A closely analogous method of computing mortality rates by age within the first year of life as used by the Registrar-General of England and Wales is described by Moriyama and Greville in *Vital Statistics—Special Reports*, Vol. 19, No. 21, p. 399, published by the United States Bureau of the Census, November 10, 1944.

## Rheumatic Fever as a Reportable Disease

The latest edition of *The Control of Communicable Diseases*,\* says that "rheumatic fever is not communicable. The preceding streptococcal infection which precipitates rheumatic fever which is communicable has usually subsided at the time that rheumatic fever manifests itself." It says further, "Etiologic agent—unknown. Source of infection—unknown. Mode of transmission—unknown. Susceptibility and immunity—unknown."

This large unknown area gives point to the growing movement to include

rheumatic fever among the reportable diseases. At the present time nine states—Arizona, California, Illinois, Iowa, Maryland, Michigan, Rhode Island, Utah, and Wyoming—and the District of Columbia require the reporting of rheumatic fever. Of the nine, only three are among those with the highest death rates from acute rheumatic fever—3 or more per 100,000 of 1940 population in the 2 year period 1939–1940. Even though a death rate is an imperfect measure for this condition, which is more often disabling than fatal, nevertheless the figures indicate that other states may see advantage in making the disease reportable.

\* *The Control of Communicable Diseases*. 6th ed. American Public Health Association. 1945. 35c.

# Nutrition and the Oral Tissues

MAURY MASSLER, D.D.S.

*Director, Child Research Clinic, University of Illinois College of Dentistry,  
Chicago, Ill.*

THE oral tissues are peculiarly sensitive to nutritional deficiencies and dietary aberrations. Clinically, the oral tissues are often the first to show the effects of such deficiencies, particularly if the deficiency is subclinical in nature. The oral tissues mirror the nutritional status of the body because of two unique characteristics:

1. The oral tissues range from the simplest (mucous membrane) to the most highly specialized tissue (the papillae of the tongue and the enamel and dentin). There are present, side by side, hard and soft tissues of both epithelial and connective-tissue origin. A highly varied range of responses and types of tissue reactions can therefore be seen at any one time. In addition, the oral tissues are constantly subjected to trauma and irritation by mechanical, thermal, and bacterial agents, and therefore are the first to exhibit the effects of systemic disturbances.

2. The oral cavity is an internal cavity of the body, dark and moist, and lined by a true mucous membrane continuous with the mucosa of the gastrointestinal tract. It receives the secretions of specialized glands and takes a major rôle in digestion. Yet of all the internal cavities of the body, it is the only one that is readily accessible and easily examined without the aid of highly specialized instruments.

When one has learned the simple alphabet of the oral tissues, he can read a clearly written answer to many of the mysteries of the state of nutrition of the body. The oral tissues have been called the barometer of the state of nutrition of the body.<sup>1</sup> They are even more than

that. The enamel and dentin are kymographic, fixed records of the past history of the individual. The alveolar bone, the gingivae, and the tongue reflect the present internal status of the body as quickly as a thermometer reflects the temperature. The routine examination of the teeth, the gums, the tongue, the lips, and the saliva at periodic intervals is a simple and fairly accurate method of checking upon the nutritional status of both the child and the adult.

## THE TEETH

The tissue affected by a given nutritional deficiency depends upon (a) the particular function of that nutritional element in the body economy, and (b) the specialized nature of the tissue and its ability to respond. For example, vitamin D is concerned with calcium metabolism, and therefore those tissues intimately concerned with calcium metabolism—the calcified tissues, bone and teeth—can be expected to respond early to a mild deficiency of vitamin D.

The type of response of a given tissue to a particular deficiency depends a good deal upon the stage of development of the organ or tissue examined. A young growing tissue responds quickly and almost violently to even minor changes in its food supply, or internal environment, and the effect is often permanently recorded in its structure. An adult, slowly growing tissue, is affected to a much lesser degree, while an old, non-growing tissue cannot respond and is therefore unaffected by even severe deficiencies.

*The Developing Teeth*—During their

<sup>1</sup> Based on a paper presented at a Joint Session of the American School Health Association with the Food and Nutrition and the Dental Health Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

forming and calcifying period, the enamel and dentin are extremely susceptible to even minor variations in calcium metabolism (and vitamin D deficiencies).<sup>2</sup> The effects are recorded clearly and permanently within the structure of the enamel and dentin as hypocalcifications or, in severe cases, as hypoplasias.

The period of susceptibility to nutritional deficiencies begins with the development of the deciduous teeth at about 4 months in utero and lasts until the crowns of the permanent teeth (except the third molars) are completed at about the 6th year of life. The dentin of the roots rarely shows clinical abnormalities as a result of dietary deficiencies.

It would be a mistake to assume equal susceptibility of the dental tissues to disturbances in calcium metabolism throughout their developmental period. Actually, the tissues formed during the prenatal period seldom if ever show any defects in calcification or formation because the developing fetus is a very well protected organism.<sup>3</sup> Even severe maternal deficiencies do not affect the teeth of the growing fetus.

On the other hand, the period from birth to about the end of the 1st year is a period during which the enamel, dentin, and bone show, in the vast majority of cases, severe disturbances in calcification. Very minor variations in nutrition and in health result not only in hypocalcifications, but often in enamel hypoplasias. In fact, 85 per cent of all enamel hypoplasias occur during the 1st year of life—often as a result of a relatively mild gastrointestinal upset, dietary incompatibility, or nutritional deficiency.<sup>3</sup> The period from 2 to 6 years is a more resistant one and disturbances in enamel and dentin appear to a much lesser extent. After 6 years of age the recording period of the enamel is completed (except in the third molars).

*The Adult Teeth*—The erupted tooth

is an adult organ and the enamel and dentin of the crown are non-growing tissues. They can therefore no longer be affected directly by any nutritional deficiency. Only local or topical factors can affect the tooth structure. These injuries are primarily bacterial or physical in origin (caries, erosion). The *adult* tooth reflects the environment in the oral cavity (quality of the saliva) and the physical character of the diet rather than nutritional indiscretions.<sup>4</sup>

The question of calcium withdrawal from the teeth is frequently raised because of a mistaken analogy between teeth and bone. The adult enamel has no vascular supply or cellular mechanism to make calcium withdrawal possible, as it is in bone.<sup>5</sup> The best proof of this fact is derived from the fact that rats subjected to parathyroidectomy and repeated pregnancies and lactations show severe bone changes and destruction but absolutely no effects upon the adult enamel and dentin.<sup>6</sup> In man, a similar experiment demonstrating the basic difference between bone and teeth has been observed in India. Women suffering from severe osteomalacia show no effects upon the enamel and dentin and in addition are relatively caries-free.<sup>7</sup>

#### THE ALVEOLAR BONE

In contrast to the teeth, the alveolar bone is an ever changing tissue, constantly being built up, torn down, and rebuilt. Like the teeth, however, it is an excellent index to and reflects clearly disturbances in calcium metabolism. Since the use of dental x-rays is as routine to the dentist as the thermometer is to the physician, careful examination of the alveolar bone can do much toward the early detection of nutritional deficiencies—even in the adult. The need for just such criteria of assessment for calcium needs in the adult has been very well shown by Youmans.<sup>8</sup>

## THE GUMS AND GINGIVAE

The earliest sign of a frank or sub-clinical vitamin C deficiency is often a painful marginal gingivitis with bleeding upon the slightest trauma. However, this gingivitis must be clearly distinguished from a purely local gingivitis by careful analysis and prophylaxis.<sup>9</sup>

A "normal" level of ascorbic acid in the blood is not sufficient evidence, in itself, to exclude a deficiency in the tissues. In addition, there are many instances in which a deficiency may be apparent only in a single tissue. Such a localized tissue reaction indicates that the deficiency is only a relative one, i.e., *minimal* amounts of a given food element are present so that, while no frank and typical deficiency state exists, a particular tissue using large amounts of that element may suffer from an actual deficiency when subjected to stress. Vitamin C is essential to rapid wound healing.<sup>10</sup> Thus the constantly traumatized and irritated gingivae may be the only sign of a latent or sub-clinical vitamin C deficiency.<sup>11</sup>

There are also many instances of endogenous deficiencies in which symptoms of a nutritional deficiency exist in spite of an adequate intake. Sometimes a defect in the absorptive mechanism can be discovered (achlorhydria, celiac disease) and sometimes a defect in transportation or storage occurs (liver damage, rat vs. guinea-pig). More recently we have begun to realize that endogenous deficiencies may occur as a result of the failure of the tissues to utilize the food elements, all other factors being normal.<sup>12</sup>

Thus we are becoming more and more aware of the necessity for examining specific tissues for clinical signs of nutritional deficiencies rather than depending only upon the laboratory analysis of a blood sample. The work of Kruse<sup>11</sup> and others using the capillary microscope and the slit lamp indicates that the examination of the gingivae may

offer a valuable means of clinically assessing the utilization of vitamin C by the tissues—and therefore the detection of subclinical and endogenous deficiency states.

## THE TONGUE AND LIPS

The specialized epithelium on the dorsum of the tongue is susceptible to even mild deficiencies of the vitamin B complex, particularly riboflavin and niacin. The capillary network supplying the fungiform and filiform papillae is so affected as to produce a characteristic glossitis. While the exact mechanism involved is still somewhat obscure, the clinical stages have been clearly described and are readily recognized.<sup>13, 14</sup>

*Riboflavin deficiency* results in a magenta-colored, pebbly tongue from which the filiform papillae are desquamated and the fungiform papillae engorged.<sup>15, 16</sup> A concomitant cheilosis, or maceration and fissuring of the angles of the mouth, usually occurs, as well as a vascularization of the sclera of the eye.<sup>17</sup> The glossitis and cheilosis must be distinguished from the atrophic glossitis and pseudo-cheilosis found in edentulous persons or in those with poorly fitting artificial dentures.<sup>18</sup>

*Niacin deficiency* results in a characteristic fiery-red, atrophic, burning glossitis.<sup>19</sup> Both the filiform and fungiform papillae are atrophied. The tongue may be swollen in the early stages and shrunken later. The entire oral mucosa as well as the gingivae often becomes reddened and ulcerated. These ulcers present a grayish exudate which yields rich cultures of Vincent's organisms. This type of infection subsides after adequate niacin therapy.<sup>20</sup>

A measurable proportion of the patients in the older age groups who complain of abnormal oral sensations (glossodynia and abnormal taste sensations) respond favorably to vitamin B complex therapy.

## SALIVA

Water is not often considered a dietary factor since it is so plentiful. However, a deficiency in water intake or an aberration in water metabolism can certainly have serious consequences. The oral tissues are normally bathed in a watery medium and are quickly affected by a reduction in the flow of saliva. A decrease in the *quantity* of saliva such as occurs in all dehydration states and fevers soon results in a coating of the tongue. The dry, coated tongue is an excellent clinical index to the state of dehydration of the body.<sup>13, 14</sup>

The significance of changes in the *quality* of the saliva merits further investigation and will certainly do much to clarify the relation between systemic factors and dental decay.

## ORAL HYGIENE

The physical character of the food is not a nutritional factor but it is an important dietary consideration. The natural cleansing action of the food is an important adjunct to good oral hygiene. The detergent action of the food must supplement the toothbrush in preventing the accumulation of food debris, with subsequent caries and local gingivitis.<sup>21, 22</sup> Since relatively few individuals use the toothbrush correctly or effectively, the physical character of the food is an important consideration in planning a well balanced diet.

## CONCLUSION

Routine examination of the oral tissues offers a relatively simple and fairly accurate index to the state of nutrition of the individual.

## REFERENCES

1. Spies, Tom D. Diagnosis and Principles of Treatment of Dietary Deficiency Diseases. *Texas State J. Med.*, 38:427-431 (Nov.), 1942.
2. Schour, Isaac. Calcium Metabolism and Teeth. *J.A.M.A.*, 110:870-877 (Mar. 19), 1938.
3. Massler, M., Schour, I., and Poncher, H. G. Developmental Pattern of the Child as Reflected in

the Calcification Pattern of the Teeth. *Am. J. Dis. Child.*, 62:33-67 (July), 1941.

4. Schour, I., and Sarnat, B. G. Oral Manifestations of Occupational Origin. *J.A.M.A.*, 120:1197-1207 (Dec. 12), 1942.

5. Schour, Isaac. Calcium Metabolism, Pregnancy and Caries. *Bull. Pharmacy & Therapeutics*, University of Illinois, 1941.

6. Schour, I., Chandler, S. B., and Tweedy, W. R. Changes in Teeth Following Parathyroidectomy. I. The Effects of Different Periods of Survival, Fasting and Repeated Pregnancies and Lactations on the Incisors of the Rat. *Am. J. Path.* 13, 6:945-970 (Nov.), 1937.

7. Day, C. D. Marshall. Nutritional Deficiencies and Dental Caries in Northern India. *Brit. Dent. J.*, 76:115-122, 143-147 (Mar.), 1944.

8. Youmans, J. B., Patton, E. W., Sutton, W. R., Kern, R., and Steinkamp, R. Surveys of Nutrition of Populations. 4. The Vitamin D and Calcium Nutrition of a Rural Population in Middle Tennessee. *A.J.P.H.*, 34, 10:1049-1057 (Oct.), 1944.

9. Restarski, J. S., and Pijoan, M. Gingivitis and Vitamin C. *J. Am. Dent. A.*, 31, 19:1323-1327 (Oct.), 1944.

10. Eddy, W. H., and Dalldorf, G. *The Avitaminoses*. 2nd ed. Williams & Wilkins, 1941.

11. Kruse, H. D. The Gingival Manifestations of Avitaminosis C, with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Milbank Mem. Fund Quart.*, 20, 3:290-323 (July), 1942.

12. Di Sant'Agnese, P. A., and Larkin, V. de P. Impairment of Vitamin A Absorption—Intractable Infantile Eczema. *Proc. Soc. Exper. Biol. & Med.*, 52:343-344, 1943.

13. Massler, M., and Schour, I. *Atlas of the Mouth and Adjacent Parts in Health and Disease*. American Dental Association, 1944.

14. Jeghers, Harold. Nutrition: The Appearance of the Tongue as an Index of Nutritional Deficiency. *New England J. Med.*, 227:221, 1942.

15. Jeghers, Harold. Riboflavin Deficiency. IV. Oral Changes, 257-261. *Advances in Internal Medicine*, V. 2, Interscience Publishers, Inc., New York, N. Y. 1942.

16. Jones, H. E., Green, H. F., Armstrong, T. G., and Chadwick, V. Stomatitis Due to Riboflavin Deficiency. *Lancet*, 1, 23:720-723 (June 3), 1944.

17. Sydenstricker, V. P., Sebrell, W. H., Cleckley, H. M., and Kruse, H. D. The Ocular Manifestations of Ariboflavinosis. *J.A.M.A.*, 114:2437-2445, 1940.

18. Nippert, P. H., and McGinty, A. P. Riboflavin Deficiency versus Perleche. Differential Diagnosis of Fissuring of the Labial Commissures. *J. Med. Assoc. Georgia*, 32, 9:295-297 (Sept.), 1943.

19. Kruse, H. D. The Lingual Manifestations of Aniacinosis, with Especial Consideration of the Detection of Early Changes by Bio-Microscopy. *Milbank Mem. Fund Quart.*, 20, 3:262-289 (July), 1942.

20. King, T. D. Vincent's Disease Treated with Nicotinic Acid. *Lancet*, 239:32-32, 1940.

21. Pelzer, R. H. A Study of the Local Oral Effect of Diet on the Periodontal Tissues and Gingival Capillary Structures. *J. Am. Dent. A.*, 27:13-25 (Jan.), 1940.

22. Knighton, Holmes T. Effect of Various Foods and Cleansing Agents on the Elimination of Artificially Inoculated Yeast from the Mouth. *J. Am. Dent. A.*, 29, 17:2012-2018 (Nov.), 1942.

For more complete reviews on this subject see:

Wolbach, S. B., and Bessey, O. A. Tissue Changes in Vitamin Deficiencies. *Physiol. Rev.* 22, 3:233-289 (July), 1942.

Schour, I., and Massler, M. The Effects of Dietary Deficiencies on the Oral Tissues. *Physiol. Rev.*, 1944.. In Press.

# Physical Growth in Childhood and Military Fitness<sup>\*</sup>

ANTONIO CIOCCO, Sc.D.

*Division of Public Health Methods, U. S. Public Health Service, Bethesda, Md.*

THIS report summarizes certain data on the Selective Service status of a sample of men whose stature and weight were measured a number of years ago when the men attended grade or high school. The purpose of the present analysis is simply to learn whether men who have been disqualified for military service differed in childhood physical growth from men who have been accepted.

the importance of some one factor, for example, nutrition or diseased tonsils, on the results. It is well appreciated that adequate quantitative data are required for a solution of this problem, and that such data must be obtained by continued and periodic observations of the same individuals and by extending the observations beyond childhood. The study of which this is a preliminary report was undertaken in the light of these considerations.

The information that can be thus acquired is pertinent to the solution of one of the important problems connected with school health work. That problem concerns the value of observations on physical growth and their interpretation with reference to health and disease. Although it has now become a widespread practice in schools to measure the physical growth of children, and stature and weight are the two physical characteristics generally measured, there is evidence of confused thinking as to the significance of variations in growth patterns. The confusion is due undoubtedly to the inherent complexity of the growth processes and of the many factors which influence them. Lacking the basis for a correct interpretation of the results of measurements, there arises the tendency either to disregard them or to overemphasize

## MATERIAL AND METHOD

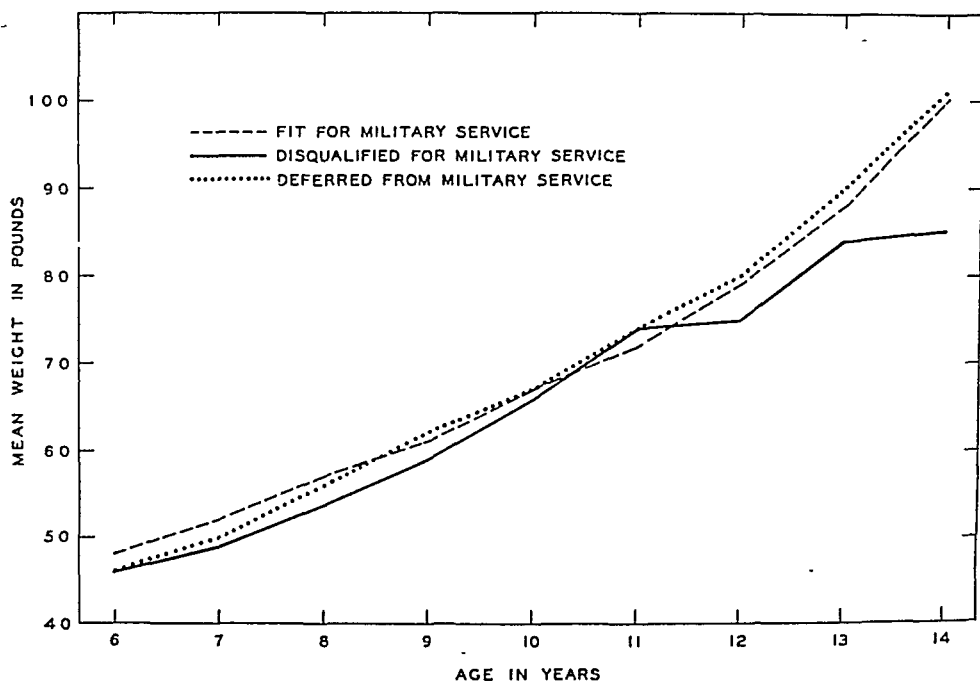
The records of stature and weight are those collected at Hagerstown, Md., during the school years 1923-1927 and since 1933 by the U. S. Public Health Service. All the measurements were taken in the month of May, and the age at the time of observation is the age at last birthday calculated as of May 1 of the year of measurement. Only records for white children have been used. The measuring technique has been described in detail elsewhere.<sup>1, 2</sup>

The steps in selecting the sample here studied were the following:

1. From the Hagerstown files were extracted the records of all boys born between 1910 and 1925.
2. These records were matched with the list of registrants of one of the two Selective Service Boards of Washington County.
3. Through the kind coöperation of the officials of that Selective Service Board, information was obtained about the classification of the registrants as of September 1, 1943, the date when this study was initiated.

<sup>\*</sup> Based on paper presented at a Joint Session of the School Health and Vital Statistics Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

FIGURE 1.  
BOYS MEASURED IN 1923-27 ACCORDING TO SELECTIVE SERVICE STATUS  
SEPTEMBER, 1943



All together records were found for 12,634 annual weight measurements on boys born between 1910 and 1925, and 5,122 records of annual stature measurements. Measurements of stature were not taken before 1935, hence the smaller number of these records.

Of the above annual measurements 6,061 records of weight and 2,596 records of stature concerned boys who were not registered at the specific Selective Service Board. In this group are included boys who died or moved from Hagerstown after the measurements were taken, or are registered at the other board.

There were found weight and stature measurements on 1,631 Selective Service registrants. On the basis of the Selective Service classification of the date stated the registrants have been grouped in the following three categories:

1. *Physically fit*—Men already serving in

the armed services and men not yet inducted on September 1, 1943, but classified in 1-A, accepted for general military service, or in 1-A(L), accepted for limited service

2. *Disqualified*—Men classified in 4-F

3. *Deferred*—Men in other classifications

The school records for the 1,631 Selective Service registrants consist of: 4,126 annual weight and 2,001 annual stature measurements on the physically fit; 1,000 weight and 363 stature measurements on the disqualified; and 1,447 measurements of weight and 162 of stature on the deferred.

It is a well known fact that for some time there has been an upward trend in the weight and stature of children. Since this trend might affect the comparability of the above three groups, the data of all the annual measurements have not been combined but are considered separately for the following three periods: 1923-1927, 1933-1937, and 1938 and later.

# WEIGHT IN SCHOOL AND SELECTIVE SERVICE CLASSIFICATIONS

The weight measurements taken when the three groups of Selective Service registrants attended grade or high school are shown in Figures 1 to 3 for the three periods indicated.

Considering the measurements taken in 1923-1927 (cf. Figure 1), that is, about twenty years before the Selective Service examination, one notes that at each age except 11 years the boys who later were disqualified for military service were lighter on the average than the boys who passed the physical examinations. Disregarding the boys measured at 11 years of age, the average differences between fit and disqualified boys vary from 0.9 lbs. at 10 years of age to 3.9 lbs. at 12 years.

A similar comparison for measurements taken in 1933-1937, and 1938 and later, reveals differences in the same direction but they are more marked. In these two series, at every age the boys who were eventually found fit for military training were heavier than the boys who eventually did not qualify.

When the three series of measurements are combined as shown in Table 1, the differences between the boys who were later accepted and those who were

disqualified for military service are just as striking. The data of Table 1 indicate that the former weighed about 2 lbs. more than the latter when the measurements took place at 11 years of age or earlier; and from 5 to 11 lbs. more when the measurements were taken at 12 years of age and later.

The differences between the two groups of registrants of the same age are not always statistically significant but the consistency in the direction of the differences warrants the conclusion that the boys who were later to be disqualified for military service were as a group lighter in weight than the boys who eventually qualified for military service. This is true even of those measured as long ago as twenty years before their Selective Service examination.

Data are also presented regarding the weight in childhood of the men deferred and those not now registered at the specific Selective Service board in Hagerstown. The former reveal that the average weight of these boys in general is somewhat less than although close to the averages of the boys who were found fit in adult years. This is to be expected. In the first place, the deferred group may be biased by the

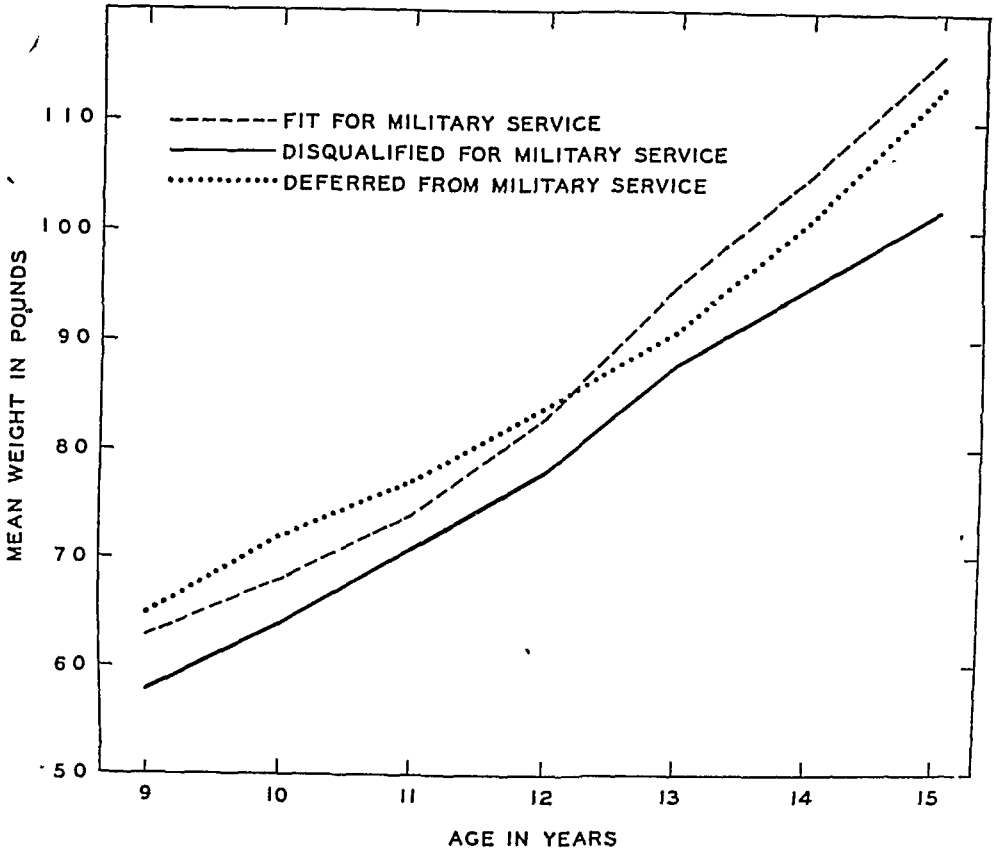
TABLE 1

*Mean Weight (in Pounds) of Hagerstown White Males, Classified by Age at Time of School Examination and Selective Service Status on September 1, 1943*

Age at measurement	Selective Service status, September 1, 1943											
	Physically Fit				Disqualified				Deferred			
	Weight		No. of boys	Standard deviation	Weight		No. of boys	Standard deviation	Weight		No. of boys	Standard deviation
	Mean				Mean				Mean			
6	49	48.0	6.4	22	45.8	4.1	39	45.4	5.3	142	47.2	6.1
7	146	51.7	7.0	54	48.8	5.4	85	50.2	6.0	403	50.4	6.2
8	289	56.7	8.6	88	54.0	7.8	144	56.3	7.6	525	55.8	7.5
9	340	62.2	9.5	96	58.9	8.2	199	62.4	9.8	572	60.6	8.4
10	386	67.8	10.9	93	65.3	10.9	201	67.8	12.2	603	67.7	9.4
11	464	74.0	10.1	99	72.2	13.2	179	74.6	13.2	625	74.0	12.6
12	460	82.4	12.7	103	77.1	16.7	195	81.3	13.6	645	82.1	14.9
13	495	94.4	18.6	114	87.6	20.5	152	91.0	17.7	668	93.4	18.3
14	490	108.1	21.0	108	97.4	23.4	118	103.4	19.1	604	106.8	22.2
15	375	120.4	21.1	93	109.8	24.0	58	111.9	24.8	476	118.9	21.0
16	267	133.4	24.3	56	122.4	23.9	37	133.9	14.7	358	130.3	24.1
17	220	141.1	22.3	37	133.4	23.9	23	140.7	6.0	288	139.1	24.6
18	111	145.8	25.7	22	138.1	21.2	11	134.5	15.8	109	144.1	21.5



FIGURE 2.  
BOYS MEASURED IN 1933-37 ACCORDING TO  
SELECTIVE SERVICE STATUS  
SEPTEMBER, 1943



tendency on the part of boys with accelerated growth to marry earlier and have a family. Secondly, the disqualified would constitute only a minority in any group of men. As for the boys not registered in the Hagerstown board, they constitute in effect a control group and, as would be expected, the mean weights of this group fall between the mean weights of the fit and the disqualified at nearly every age.

#### DEVIATION FROM AVERAGE WEIGHT IN CHILDHOOD AND FREQUENCY OF DISQUALIFICATION

The significance of the above findings are perhaps better appreciated when

one examines the percentage of boys who were disqualified among those who deviated by a specified amount from the average weight for their age. Data on this point are summarized in Table 2. The deviation from the average weight is here expressed in terms of the standard deviation or sigma. The average weight for each age is the mean of the weights of the physically fit plus the disqualified.

The data shown in Table 2 reveal principally that:

1. The percentage of disqualifications is highest among boys whose weight was less than the average by more than 1 sigma. Only for two extreme age groups with few observa-

TABLE 2

Percentage Disqualified by Selective Service, Classified by Age at Time of School Examination and by Deviation from Mean Weight of Age Group

Age at measurement	Deviation from mean weight (in units of the standard deviation)				
	-1σ or greater	-½σ to -1σ	-½σ to +½σ	+½σ to +1σ	+1σ or greater
6	38	50	27	38	10
7	42	37	21	27	9
8	41	20	22	20	18
9	38	21	22	13	16
10	36	15	18	24	13
11	28	17	14	12	21
12	35	14	12	19	17
13	32	24	14	10	19
14	37	25	12	12	12
15	37	25	15	15	14
16	34	22	13	22	8
17	20	15	14	6	16
18	24	28	9	19	8

tions is this not found. In general, among the boys whose weight was less than the average by 1 sigma or greater over 30 per cent were later disqualified. This percentage, in general, is over 1½ times the rate of disqualification found for all boys.

2. There appears to be a tendency, though not a very consistent one, toward a decrease in the rate of disqualification with increase in weight. In 7 of the age groups studied, the percentage of rejections is lowest for the boys whose childhood weight was above average by 1 sigma or greater.

3. The percentages of disqualifications relative to deviation from average weight do not increase or decrease regularly with increasing age.

These findings all point to an association between growth in childhood and development of physical defects leading to disqualification for military service.

It can also be inferred that underweight more than overweight is associated with the development of these defects, and that the more marked the degree of underweight the greater are the chances of manifesting those defects.

#### STATURE IN CHILDHOOD AND SELECTIVE SERVICE CLASSIFICATION

In Table 3 data are presented on stature of boys measured since 1933. From this table it appears that for each age, with but one exception, the boys who later were found fit for military service were taller than the boys who were disqualified. The differences are in general small, being less than 5 cm. in most instances and not statistically significant in the majority of age groups.

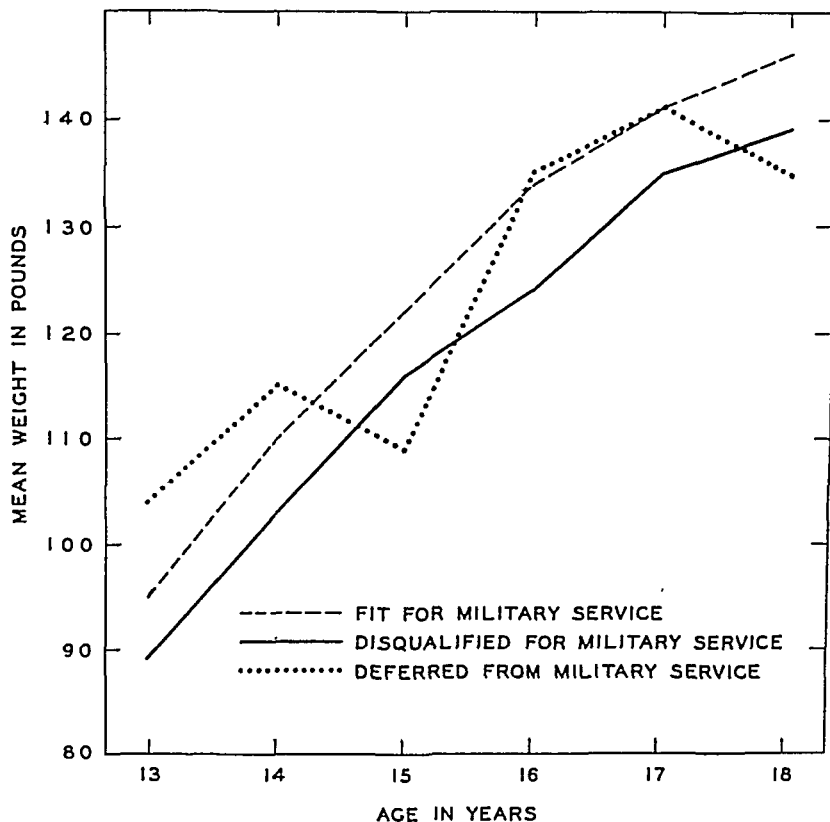
TABLE 3

Mean Stature (in Centimeters) of Hagerstown White Males, Classified by Age at Time of School Examination and Selective Service Status on September 1, 1943

Selective Service status, September 1, 1943															
Age at measurement	Physically Fit						Disqualified				Deferred		Not registered at Selective Service Board		
	Stature			No. of boys	Stature		No. of boys	Stature		No. of boys	Mean	Standard deviation	No. of boys	Stature	
	No. of boys	Mean	Standard deviation		Mean	Standard deviation		Mean	Standard deviation					Mean	Standard deviation
9	16	134.3	5.6	*	.....	...	*	.....	...	76	130.8	5.8			
10	84	137.1	6.6	13	132.2	6.4	*	.....	...	34	134.4	6.3			
11	82	142.2	6.9	11	142.4	6.2	*	.....	...	201	141.1	6.5			
12	209	147.1	7.5	35	142.2	8.1	16	149.7	6.7	296	147.0	6.0			
13	303	153.4	8.2	57	151.4	9.2	27	154.4	8.5	379	152.6	8.4			
14	352	160.0	9.0	69	156.8	9.6	23	162.4	8.2	439	159.4	9.1			
15	319	166.3	8.4	67	162.4	8.7	17	164.9	7.7	404	164.4	8.2			
16	272	170.1	7.0	40	166.5	9.8	27	171.1	5.6	333	168.8	8.1			
17	219	172.8	6.8	35	171.7	7.8	23	173.7	5.8	282	171.6	7.9			
18	111	173.7	6.5	20	171.2	6.9	11	169.9	4.9	109	171.9	3.8			

\* Less than 10 boys measured

FIGURE 3.  
BOYS MEASURED SINCE 1938 ACCORDING TO  
SELECTIVE SERVICE STATUS  
SEPTEMBER, 1943



However, the consistency in the direction of the difference makes it appear that the disqualified men as children were already differentiated in growth of stature from the children who were to be found fit for military service.

#### DISCUSSION

The data reveal that in general at each age boys who were later disqualified for military service were on the average lighter and shorter than the boys who were found qualified. The findings are the same whether one compares the boys measured twenty years or only one or two years before being examined for military service, although the differences are larger for the more

recent periods. Since the final size reached by the boys is not known, it is not certain if the observed differences in stature and weight indicate only delay in growth or a smaller adult size. The findings on the boys of age 18 would favor the latter conclusion.

In considering the findings it should be borne in mind that disqualifications for underweight constitute only a small percentage of the rejections, and it can therefore be presumed that the number of such rejections is not sufficient to produce the observed lower weight of the group of disqualified in this sample. If this presumption is tenable then it must be inferred that retarded growth is associated with the other pathological proc-

esses which eventually led to the disqualification of the men for military service. This inference finds support in the results of a survey<sup>3</sup> which found that children with defects (cariou teeth, diseased tonsils and adenoids, defective vision, enlarged cervical and submaxillary glands) were smaller than children without such defects. The conclusion would seem warranted that the measurement of growth has a definite value as an index of physical status in general and can be effectively employed as one method of "screening" children with physical defects. With reference to this point, it is found also that the percentage of disqualifications was highest among boys who deviated the most in the direction of underweight from average weight of their age group.

The simplicity with which accurate measurements can be taken and the ease with which records can be made and kept for comparisons over long periods of time are other factors pertinent to the use of growth measurements in school health work.

It should be emphasized that although the evidence indicates that growth status is valuable as an index of physical state, retarded growth is not always a sign of disease. Instead, the observations on growth status should be regarded as are all physical signs elicited on examination of an individual, and the growth status of the individual should be integrated with all other physical data before arriving at a definitive diagnosis.

The criterion employed to evaluate the adult physical status of the boys measured is determined by standards established for military personnel. It is clear that a man disqualified for military service on physical grounds is not

necessarily ill or incapacitated for useful civilian work. However, the findings of this study are not invalidated nor do they acquire less importance because the disqualifying defects are not fully disabling or fatal. The disqualified men have certain defects and a positive association has been found between the development of these defects and retarded growth in childhood.

The above findings, taken together with similar observations<sup>4</sup> that certain disqualifying defects were already evident in childhood, emphasize the importance of child hygiene work for the health and welfare of the population. There can be no doubt that the health of the child will be reflected in that of the adult, and that all efforts which increase the physical well-being of children will result in healthier adults. However, the possibility of seeking and correcting in childhood the roots of many adult diseases has not been sufficiently appreciated in the past. School health programs have been initiated without a clear conception or definition of this main goal and consequently they do not receive the required support from parents, school and health authorities. The results of this study should provide a further stimulus to the appraisal of school health programs in relation to what they aim to do and actually accomplish for the health of children.

#### REFERENCES

1. Palmer, C. E. Seasonal Variation of Average Growth in Weight of Elementary School Children. *Pub. Health Rep.*, 48:211-233, 1933.
2. Wolff, G. A Study on the Trend of Weight in White School Children from 1933 to 1936. *Child Development*, 11:159-180, 1940.
3. Gafafer, William M. Relation of Physical Defects to the Physical Growth of Children of 21 States. *Pub. Health Rep.*, 51:831-841, 1936.
4. Ciocco, A., Klein, H., and Palmer, C. E. Child Health and Selective Service Physical Standards. *Pub. Health Rep.*, 56:2365-2375, 1941.

# Memphis and Shelby County Tuberculosis Control Program\*

L. M. GRAVES, M.D., F.A.P.H.A., AND F. H. COLE, M.D.

*Health Officer, and Director, Division of Tuberculosis Control, Memphis and Shelby County Health Department, Memphis, Tenn.*

IN July, 1941, a Division of Tuberculosis Control was organized in the Memphis and Shelby County Health Department, in an effort to intensify the program against tuberculosis. This paper will present the administrative organization of the division together with several statistical tables illustrating its activities to date. One of the primary objectives of the new plan was to correlate the work of various official and voluntary organizations which were working wholeheartedly in the field of tuberculosis control, but were often at cross purposes with each other. For instance, the local tuberculosis society had at that time a group of visiting nurses who did field work in competition with the regular district nurses of the health department. There was also only somewhat perfunctory cooperation between the tuberculosis sanatorium and the health department, so that neither organization could complement the work of the other.

In order for the coordination to be most effective, a unique administrative plan was adopted. Several members of the staff of the tuberculosis division serve in a liaison capacity with other groups. The nursing supervisor directs a group of generalized staff nurses, and serves also as consultant on matters pertaining to tuberculosis nursing throughout the health department. The x-ray

technicians serve both the tuberculosis sanatorium and the field program, and the director of the tuberculosis division is a regular member of the staff of the sanatorium.

Since this plan has been in operation, excellent cooperation has existed among all the organizations concerned in tuberculosis work. The Shelby County Tuberculosis Society no longer conducts a field program. It contributes money to the Health Department which is used to pay a clerk and a nurse in the tuberculosis division, and it is also liberal in donations for special equipment. Its program is now almost entirely limited to educational activities and social service, and its work is planned in consultation with the Health Department. All field nursing is done by the Health Department staff. No organization in the county is engaged in any tuberculosis program without the full knowledge of the Health Department.

A definite division of responsibility was made between the sanatorium and the Health Department, with the latter assuming full responsibility for all indigent patients before their admission to the sanatorium, and after their discharge, including follow-up examinations, nursing visits, and treatment. It is impossible to confine all infectious tuberculous individuals in institutions throughout their contagious period. Therefore, tuberculosis control will remain principally a field problem, even after adequate hospital beds are

\* Presented before the Southern Branch A.P.H.A. at its Annual Meeting in St. Louis, Mo., November 14, 1944.

available. The function of the hospital is to prepare the patients to return to the field.

With the sanatorium and Health Department so intimately connected, the patients are under continuous observation from the time of first diagnosis through the period of hospitalization, and until the termination of the case, either by death, removal, or recovery. This provides a continuity in management of each case, which is both beneficial and reassuring to the patients.

Since we are responsible for all tuberculosis work that goes on outside the sanatorium, our program is twofold, first, case finding, and second, case follow-up. These will be discussed in some detail. For convenience in presentation, the follow-up phase will be described first.

No patient is discharged from the sanatorium without the consent of the director of the tuberculosis control division. All patients are interviewed by him before they leave the sanatorium, and their home management is planned at that time. A patient whose economic station permits is referred to the physician of his choice for further care, and a summary of his treatment is sent to the physician. At least once a year thereafter, a public health nurse is asked to visit the patient and to report whether or not he has remained under treatment. Other than that, our services are given to these patients only when requested by the attending physician. The indigent patients are referred to a tuberculosis division clinic for further observation. Pneumothorax refill stations have been set up in five district health centers in the city and county, and clinic sessions are held in the different places at varying times to meet the convenience of all the patients. The fluoroscopes, instrument cabinets, and other equipment at these refill stations were furnished by the Shelby County Tuberculosis Society and

were purchased out of Seal Sale funds.

We are now caring for approximately 100 pneumothorax patients and giving about 350 refills monthly. In three years of this work there has not been a serious accident. Two emergency admissions to the sanatorium have been necessary, one as a result of traumatic collapse in a bilateral case, who was discharged after four days' rest. The other was for intrapleural hemorrhage, presumably from rupture of an adhesion, which occurred several days after a refill. This patient made an uneventful recovery also, but his pneumothorax was discontinued. This rather low incidence of complications we attribute to the excellent condition in which these patients are sent to us from the sanatorium. There is no time limit on occupancy at the sanatorium, and patients are kept until their lesions are stable enough to be good risks for outpatient treatment. No pneumothoraces are induced in the clinics. We consider this to be a hospital procedure. The complications which would accompany the induction of pneumothorax in the clinics are apt to result in numerous emergency admissions to the sanatorium. This would tend to increase the crowding in the sanatorium and would also lessen the confidence of other patients in the procedure.

There is a constant interchange of patients between our clinics and the physicians in town who administer pneumothorax therapy. Frequently the same patient is exchanged several times depending on his varying economic status. The practitioners in our community who are engaged in pneumothorax work have a liberal interpretation of medical indigency. No patients are required to make burdensome sacrifices in order to obtain necessary treatment.

Patients who are discharged from the hospital without pneumothorax are examined in the clinics as often as indi-

cated. Instructions for the patient are given at the interview which follows completion of the examination, and the public health nurse in his district is given a written record of the instructions, together with a recommendation for future visits. This procedure is also followed for patients who are discovered while their disease is inactive, and who are held under observation in the clinics.

The case finding program is based on a rather extensive x-ray service. The division operates an ambulatory unit which is equipped to make stereo 4 x 5 in. photofluorographic films and standard 14 x 17 in. chest films. The x-ray equipment was furnished by the Shelby County Tuberculosis Society. The Mobile Unit requires 220 volts for operation, and special receptacles have been provided at strategic locations in the city and county. Clinics are held twice a day, five days a week. A clinic schedule is drawn three months in advance and the various stops are visited as the population density warrants. This mobile unit was placed in operation in May, 1942, and has proved quite satisfactory.

A plan of operation of the case finding services was approved by the local medical society before its adoption, and has worked without friction. Patients are accepted without regard to financial status. Some are referred by their physicians, and others by the public health nurses. Still others come voluntarily for examination because of suspicious symptoms or family history of disease. The films are read and reported within one week. Written reports on referred patients are mailed to their physicians, and oral reports are given to the other patients at the clinic. Since the beginning of the program 19,709 films have been made on patients who had not been previously diagnosed as tuberculous. This included 17,547 first examinations and 2,162 recheck examina-

tions of previously negative patients. The x-ray examinations are tabulated by a punch card system and the results are periodically analyzed and studied. This enables us to identify the more productive groups and to modify our emphasis accordingly.

We have prepared several tables illustrating the findings in our x-ray examinations.

TABLE 1  
*X-ray Results by Age Groups*

<i>Age Groups</i>	<i>Number X-rayed</i>	<i>Number Positive</i>	<i>Per cent Positive</i>
0- 15	4,756	91	1.9
16- 35	10,839	597	5.5
36- 55	3,404	394	11.6
56-100	710	142	20.0
Total	19,709	1,224	6.2

Table 1 shows the number of persons examined and the number found positive by age groups. We have chosen these rather large age groups because they are significant in regard to treatment and progress. The number of cases found in the group under 15 years is, as expected, very small. Purely as a case finding operation this would be unprofitable, but we have found it advisable to include all the family in examining groups of contacts. The larger percentage of positive cases in the 36 to 55 age group points to this as a group which should be more intensely surveyed. We expect that fairly large percentages of this age group will be included in our industrial work. Above 56 years the percentage of positive x-rays is large, but the number of individuals concerned is rather small.

We do not know just how productive a case finding service should be, but our figure of 6.2 per cent appears reasonably satisfactory. Too high a figure would indicate that selection of patients is too rigid, and that numerous asymptomatic cases are being overlooked, while too low a percentage would not be feasible from an economic standpoint.

TABLE 2

*Comparative Results by Age Groups*

Age Groups	Per cent of X-rays	Per cent of Cases
0- 15	24.1	7.4
16- 35	55.0	48.6
36- 55	17.3	32.4
56-100	3.6	11.6
Total	100.0	100.0

In Table 2 we have charted the percentage of the x-rays by age group against the percentage of the total number of cases found. It is noted that in the group under 15 years, 24 per cent of our time was spent to find only 7 per cent of our cases. This chart again emphasizes that it is more profitable to examine individuals in the upper age group than children.

TABLE 3

*X-ray Results by Sex and Color*

Color and Sex	Number X-rayed	Number Positive	Per cent Positive
White Male	5,436	301	5.5
White Female	6,117	362	5.9
Colored Male	2,825	258	9.1
Colored Female	5,331	303	5.7
Total	19,709	1,224	6.2

In Table 3 the x-ray results are tabulated according to the sex and color of the individuals examined. It is rather surprising that the percentage of positive cases in the colored females is approximately the same as that in the whites. The colored male percentage is considerably higher, but the number examined is lower than any other of the four groups.

In 1943, the death rate for Negroes in the community was 115 per 100,000, while the white death rate was 37.5. It is apparent that our case finding is deficient in the colored race. We are probably examining a selected healthy group of Negroes. Over a long period of years it has been observed in Memphis that the Negro response to a generalized health program is better than the white. This does not hold

true for the tuberculosis program. Equal opportunities for examinations are arranged for Negroes and whites. The Negro will come for x-ray examination if he does not suspect that he is ill. If he has symptoms of tuberculosis he will postpone the examination until the last possible moment and will usually be found to have far advanced and bilateral disease. This attitude is probably due to the deep-seated belief among Negroes that there is no hope for recovery once a diagnosis of tuberculosis has been made. We hope that a few good results from treatment of early cases in Negroes will change this attitude. Educational work among the Negroes is especially needed. This is a field in which the school health program and the voluntary health agencies can take a leading part.

TABLE 4

*Comparative Results by Sex and Color*

Sex and Color	Per cent X-rayed	Per cent Positive
White Male	27.6	24.6
White Female	31.0	29.6
Colored Male	14.3	21.1
Colored Female	27.1	24.7
Total	100.0	100.0

Table 4 illustrates again the comparative results by percentage according to sex and color. It shows very clearly that the colored males constitute the most fertile field for future activity. An industrial survey program is being planned which will reach large numbers of Negro males at their work. This should correct this deficiency in the program.

In Table 5, the 1,224 cases of pulmonary tuberculosis have been divided by color into stages. Of all cases, 51.9 per cent were thought to be active when discovered. In the white patients only 23.8 per cent were classified as far advanced and 36.4 per cent were minimal. In colored active cases 51.5 per cent were found far advanced and



TABLE 5

*Stage and Activity by Color*

	<i>Active—51.9 Per cent</i>				<i>Inactive—48.1 Per cent</i>			
	<i>White</i>		<i>Colored</i>		<i>White</i>		<i>Colored</i>	
	<i>No.</i>	<i>Per cent</i>	<i>No.</i>	<i>Per cent</i>	<i>No.</i>	<i>Per cent</i>	<i>No.</i>	<i>Per cent</i>
Minimal	100	36.4	80	22.4	241	62.3	139	69.2
Moderately Advanced	110	39.8	94	26.1	90	23.2	40	19.9
Far Advanced	66	23.8	186	51.5	56	14.5	22	10.9
Total	276	100.0	360	100.0	387	100.0	201	100.0

only 22 per cent minimal. In the inactive group 62.3 per cent of the whites were classified as minimal.

We have made an effort not to over-read these films and have limited our diagnoses to those persons in whom sufficient x-ray evidence is present to warrant further observation. Small linear fibrotic areas and increases in lung markings are usually noted in the interpretation of the film, but are not considered diagnostic.

There has been only one instance in which a definite lesion is known to have been missed. This was a contact who was examined and reported negative. On reexamination 3 months later, a moderately advanced lesion was present. When his original film was reviewed, a minimal lesion could be seen and should have been diagnosed.

cludes active and inactive cases, and also includes household contacts and visiting contacts. Persons who are sent by their physicians are listed as suspects unless a definite diagnosis has been made, in which case they are not included in the case finding figures. People who voluntarily come to the clinic and those sent by the public health nurse because of symptoms suspicious for tuberculosis are also classified as suspects.

The high school students were members of the 11th and 12th grades. They were examined as part of an intensive health program put on in that group by the Health Department. The medical students and nurses attended the University of Tennessee School of Medicine and were examined every 9 months throughout their course of study. The prenatal patients were in attendance at the Health Department Prenatal Clinics. The Penal Farm group consists of short-term convicts at the county farm, and they are grouped with girls who were sent to the West Tennessee Isolation Hospital for venereal disease. The miscellaneous group includes draftees who were rejected at the induction stations, the Health Department personnel who are x-rayed yearly, and several small groups of workers who were examined before our industrial program was started.

TABLE 6

*X-ray Results by Sources*

<i>Source</i>	<i>Number X-rayed</i>	<i>Number Positive</i>	<i>Per cent Positive</i>
Contacts	5,895	409	7.0
Suspects	6,601	603	9.1
High School Students	2,936	4	0.1
Med. Students and Nurses	729	2	0.3
Prenatals	1,022	21	2.1
Penal Farm and Isolation Hosp.	1,052	35	3.3
Miscellaneous	1,474	150	10.0
Total	19,709	1,224	6.2

The x-ray results are tabulated by classification of patients. Contacts are defined as persons who have been in more than casual association with a known case of tuberculosis. This in-

It will be noted that the contacts were 7 per cent positive. This is considerably lower than has been reported in studies by the Tennessee State

Health Department, but they were concerned with contacts to sputum-positive cases only. The suspects are 9 per cent positive. All of this group have symptoms which are suspicious for tuberculosis and one would expect a higher percentage of positive cases. The 10 per cent in the miscellaneous group is a reflection of the rejected draftees, many of whom were previously diagnosed.

The high school students are no longer x-rayed routinely. We have substituted a small-scale industrial program, devoting one day each week to the survey of employees of war plants. This work is expected to increase the number of colored males and of older individuals.

The percentage of positive medical students and nurses is unexpectedly low and we make no attempt to explain this.

We think that the prenatal group is worthy of continued examination even though the yield is small, since these women in the productive age of life always have large groups of contacts.

The Penal Farm and Isolation Hospital individuals are a group which is greatly refractory and whose examination would be unlikely on a voluntary basis. We expected a higher incidence of tuberculosis in these people and again we make no attempt to explain the small number found.

We have recently required x-ray examination of applicants for health cards. These cards are used principally by domestic servants, and are required by the housewives before the servants are employed. We will gradually cover

a large proportion of the Negro females in the community by this program.

TABLE 7  
*Comparative Results by Sources*

Source	Per cent of X-rays	Per cent of Cases
Contacts	29.9	33.4
Suspects	33.5	49.3
High School Students	14.9	0.3
Med. Students and Nurses	3.7	0.2
Prenatals	5.2	1.7
Penal Farm and Isolation Hosp.	5.3	2.9
Miscellaneous	7.5	12.2
Total	100.0	100.0

Table 7 is an evaluation of the cases found for the time spent in various groups. The suspects do not include any persons with known contact to tuberculosis. Despite this, almost half the cases were found among suspects.

In Table 8 the 636 active cases are tabulated according to the stage of the disease and the classification of patients. Among the contacts 38.4 per cent were minimal and only 27.4 per cent far advanced. Among the suspects, over half were far advanced and only 17.8 per cent were minimal. This indicates that people who are sick will postpone examination of the chest until a large majority of them are far advanced. Among the other group of individuals the cases found were so small as to be insignificant if taken separately. They were, therefore, lumped together and the stages run comparable to those found in the contacts.

The year 1943 was the first complete year of full-scale operation of the program, and the cost for that year was

TABLE 8  
*Stage of Active Cases by Sources*

	Contacts		Suspects		Other		Total	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Minimal	84	38.4	56	17.8	40	39.2	180	28.3
Moderately Advanced	75	34.2	86	27.3	43	42.1	204	32.1
Far Advanced	60	27.4	173	54.9	19	18.7	252	39.6
Total	219	100.0	315	100.0	102	100.0	636	100.0

\$12,234.13 including salaries, allowances, material, supplies, and depreciation on equipment. No attempt was made to allocate this expense to the component parts of the program, but it was all figured on a cost per film, and cost per case basis. This amounts to \$1.50 for each x-ray examination, and \$39.72 for each new active case found. The total cost of the tuberculosis program was 2.48 per cent of the Health Department budget for 1943.

# SUMMARY

The organization of the Division of Tuberculosis Control in the Memphis and Shelby County Department of Public Health has been presented in detail together with statistical tables illustrating its operation and results to date. The salient features of this plan are:

1. The community-wide organization and prestige of the Health Department are utilized for work in tuberculosis control.
2. All work in the field of tuberculosis is coördinated through a single administrative office.
3. Coöperation with voluntary agencies as practised is mutually beneficial and prevents duplication of effort.
4. The field program assumes responsibility for management of the indigent patients at all times except during their period of hospitalization.
5. There is absolute confidence and mutual understanding in dealing with the private practitioners of medicine in the community.
6. Modern advances in equipment and in methods are adopted as soon as they can be adapted to the local needs.
7. The case finding program is changed as local experience indicates the direction for such modification.
8. This program is carried out for a relatively small proportion of the expenditure for public health purposes.

## Best Sellers in the Book Service for August

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945.....		\$1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945 .....		.35
Global Epidemiology. James S. Simmons, M.D., Tom F. Shayne, M.D., G.W. Anderson, M.D., and H. M. Horack, M. D., 1944.....		7.00
National Health Agencies. A Survey With Especial Reference to Voluntary Associations. Harold M. Cavins. 1945.....		3.00
Health Instruction Yearbook, 1945. Oliver E. Byrd, Editor. 1945.....		3.00
Municipal and Rural Sanitation. V. M. Ehlers and Ernest W. Steel. 3rd ed., 1943.....		4.00
Vital Statistics Directory. American Public Health Association. 3rd ed., 1945.....		.75
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed., 1945		4.00
Nursing in Prevention and Control of Tuberculosis. H. W. Hetherington, M.D., and Fannie Eshleman, R. N. Rev. ed., 1945.....		3.00

Order from the Book Service

# Biochemical Methods in Nutritional Surveys\*

OTTO A. BESSEY, PH.D., AND OLIVER H. LOWRY, PH.D., M.D.

*Division of Nutrition and Physiology, The Public Health Research Institute  
of The City of New York, Inc., New York, N. Y.*

THAT there is a relation between nutritional status and growth, development, and general health at many levels of nutrition is an accepted and well established fact. However, the exact quantitative relation between the various levels of nutrition and the degrees of health is not so clear.

Except for those levels of nourishment so low that obvious signs and symptoms of deficiency disease result, it is difficult to measure nutritional status. Likewise, except in cases of severe malnutrition, it is not easy to evaluate the influence of nutrition on health. The two most important needs in the field of public health nutrition are:

1. The development of more practical and adequate methods for the evaluation of nutritional status
2. The acquirement of accurate knowledge concerning the influence of nutrition on health at all levels of nourishment

These two needs are not independent. It will be necessary to find adequate methods of measuring nutritional status on large groups of people before completely satisfactory and applicable knowledge concerning the relation of nutrition to health can be obtained.

There exists considerable evidence,

derived both from studies with experimental animals and from observations on man, which indicates that there is a distinct difference between the level of nutrition just adequate to prevent obvious signs and symptoms of malnourishment and that level which will support the maximum growth, development, and general health potentialities. This evidence has been recently reviewed in a bulletin published by the National Research Council<sup>1</sup> and need not be repeated here. However, it should be pointed out that the farmer has been convinced of the importance of this difference between "just adequate" and "optimum nutrition" for some years. An increased biological efficiency, as reflected in superior production of eggs, milk, wool, meat—tangible results which can be evaluated in dollars—makes a convincing demonstration of the benefits to be derived from optimum nutrition as compared with "just adequate" nutrition under like circumstances. It seems reasonable that man would likewise derive additional benefits by better nourishment—which, in turn, would become evident in the form of better health performance. The limited observations on man indicate this to be true; however, present knowledge is scant and insufficiently quantitative. There is great need for well controlled, long-term observations on the health performance of large

\* Based on a paper presented at a Joint Session of the Vital Statistics and Food and Nutrition Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

groups of subjects which, in so far as possible, differ only in level of nutrition. Such a study would be indeed a large and ambitious undertaking. But it seems unlikely that a completely satisfactory answer to the problem of the relationship of nutrition to health in man will be found by other methods. It must be admitted, of course, that strong, indirect or incomplete evidence is often convincing in itself if there is enough of it.

There are several methods of approach to the problem of methods for evaluating nutritional status. There are the dietary history methods used to determine what the subject has been consuming in terms of dietary essentials; the clinical methods based on observations of signs and symptoms of deficiencies; and, finally, there are laboratory methods used to measure some physiological function relating to nutrition, or the concentration of the various dietary essentials present in body fluids. All of these methods, when properly used, have contributed and will, undoubtedly, continue to contribute to the problem of measuring nutritional status. The method or methods of choice for any one investigation should, of course, be greatly influenced by the particular conditions. In some cases, dietary histories will yield information of sufficient reliability and scope to serve the purpose. In other cases, careful clinical studies will be found most suitable, perhaps using laboratory methods for confirmation. In other words, the best use of those methods now available depends upon a thorough knowledge of the strong and weak points of each of the methods and good judgment as to the circumstances under which they can be applied to obtain reliable results. The wrong application of a reliable method will yield unreliable results just as certainly as the use of faulty methods.

In the present state of development

of this subject, it is not easy to determine the nutritional level of individuals or groups even by the use of all the methods mentioned above. Although limited amounts of useful data are being obtained and steady progress is being made in connection with this problem, it is obvious that methods must be greatly improved before a really satisfactory procedure will become available for use on a large scale. The present methods are reliable, at best, only in the hands of experts. Such diagnostic procedures are thus useful only in connection with well planned investigations, they cannot be thought of as nearing the stage where they can be used in the way that serological tests, such as the Wassermann test, etc., are now used.

In a general way, the concentrations of many of the nutritive essentials (minerals, vitamins, proteins) in the blood, urine and other body fluids reflect the recent dietary intake of these substances. This fact is the basis of a number of chemical procedures for measuring nutritional status. Methods are now available for the determination of several of the vitamins in the body fluids (vitamin A, thiamine, ascorbic acid, riboflavin, nicotinic acid). In the hands of skilled analysts these will yield reliable data in so far as the purely technical procedure of analysis of body fluids and tissues is concerned. However, these methods need to be made more practical. They usually require large specimens, and the often laborious and technical nature of the procedures limit the number of determinations which can be conveniently carried out. Another serious handicap in the use of these methods is the lack of the knowledge necessary for interpretation of the analysis in terms of the nutritive state of the individual. Although there is in general a correlation between dietary intake and concentration in the blood and other body fluids, there are other

factors which also influence the concentration. In addition, the concentration does not usually bear a linear relationship to dietary intake. These facts limit the scope of usefulness of chemical methods, because the methods may only be safely used under conditions which exclude the influence of the disturbing factors. This limitation undoubtedly will be greatly reduced with further understanding of the physiology and biochemistry of the vitamins, subjects which require extensive investigation.

The rapidly growing realization that nutrition plays a very important rôle in health has frequently led to haste in trying to apply the knowledge gained from animal studies and the laboratory to man. Furthermore, there has been a demand for technical methods and their use before there has been sufficient time and opportunity to develop sound, well tested, and practical procedures. Some of the disappointment resulting from the use of chemical methods arises from a lack of understanding of the care with which any chemical method must be used in order to yield reliable results. Unless the analyses are performed under the supervision of someone who thoroughly understands the pitfalls of the method, one cannot have confidence in the results. The literature contains many examples of surveys which are useless because of the lack of attention to this point.

Some of the difficulties in the use of chemical methods for nutrition surveys have been indicated above. What can be done about these difficulties?

There is a real need for the development of analytical methods which can be applied to large population groups without the difficulties now encountered. Collection of blood samples by venipuncture, tolerance tests requiring several specimens, or urine collections over a prolonged period are not practical procedures for large group investigation.

Such procedures are laborious, time-consuming, require too much equipment in the field, and cause too much distraction and too many problems in obtaining the specimens.

Recently we have been interested in trying to develop microchemical procedures whereby very small samples of blood and other tissues could be analyzed for the various nutritive essentials. There would be many advantages to such procedures, especially if finger-tip blood were sufficient. Of course, the use of such methods would not circumvent the many problems of interpretation which have been raised, but, with such techniques available, certain group studies and animal experiments which are needed for clarification of physiologic aspects of the problem would also become more feasible.

Theoretically, there is no reason why blood analysis for the nutritive essentials cannot be done on very small specimens without loss of precision. The problem simply requires the development of the proper new tools for such small volume operations. We now have in use in our laboratory micro methods for seven of the nutritive essentials or their corresponding tissue derivatives. These methods have been thoroughly tested for reproducibility and accuracy against the usual macro methods and by other standards, and are very satisfactory in this respect. They have also had a limited field test on about 1,000 subjects, which demonstrated the simplicity of obtaining and preserving specimens, and the rate at which the determinations could be done. All seven determinations which consist of vitamin A, carotene, ascorbic acid, riboflavin, serum protein, hemoglobin, and phosphatase can be done on two or three drops (0.1 ml.) of blood. Details of the methods and proof of their reliability will be included in a series of papers which are currently being pre-

pared for publication. However, I would like to describe briefly some of the procedures, the tools used, and the time involved.

Blood is collected from the finger tip into two capillary tubes, 50 cu. mm. in each. One tube contains an anticoagulant, heparin, while the blood in the other tube is allowed to clot. The tubes are closed with wax and returned to the laboratory for analysis. Two people can collect about 25 specimens per hour. In the laboratory the tubes are centrifuged, and by use of special pipettes, aliquots of the various blood elements are removed for analysis. With special microconstriction pipettes, volumes as small as 2-3 cu. mm. can be measured quickly and accurately to  $\pm 0.5$  per cent.

Ten cu. mm. of serum are removed for an ascorbic acid analysis by use of the dinitrophenyl hydrazine reaction (Roe). After preparation of a filtrate of the serum, a color proportional to the ascorbic acid content is developed by the addition of the appropriate re-

agents. The intensity of the color is measured in a Beckman spectrophotometer by the use of a special optical cell which requires only 30 cu. mm. volume. One technician can do about 50 determinations a day.

Three cu. mm. of serum are removed for a phosphatase determination by a newly developed method. In this method the serum is incubated 30 minutes at 37° C. with 50 cu. mm. of reagent, sodium hydroxide is added, and the intensity of yellow color which develops is read in a microcell in a photoelectric colorimeter. One technician can do about 100-200 determinations a day.

Two to 5 cu. mm. of serum are required to measure the serum proteins by the use of the Linderström-Lang gradient tube. One technician can do 150-200 determinations a day.

Vitamin A and carotene are measured on 35 cu. mm. of plasma after saponification and extraction of these substances into immiscible solvents. In the special

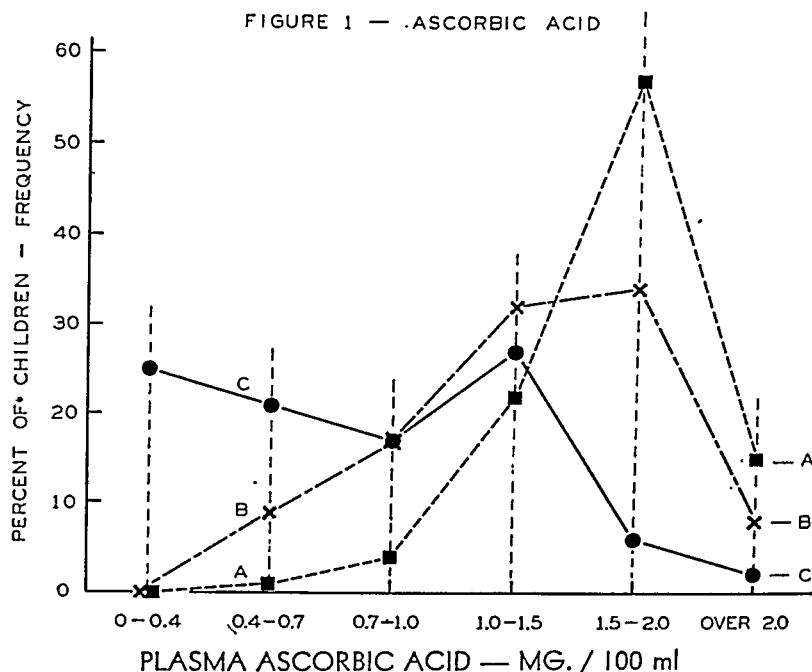
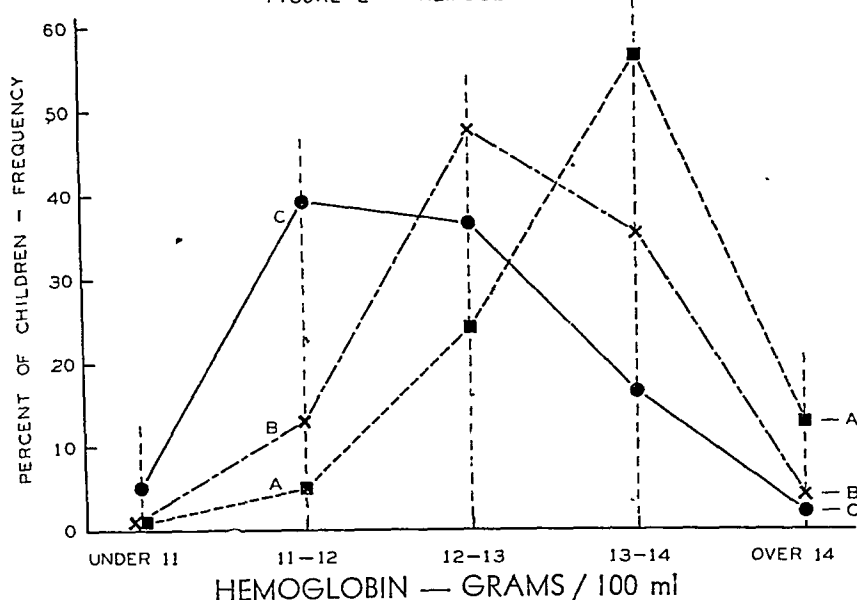


FIGURE 2 — HEMOGLOBIN



micro-optical cells used for ascorbic acid, the absorption of carotene at  $460\text{ m}\mu$  is measured. Likewise, the absorption at  $328\text{ m}\mu$  is measured. The vitamin A is then destroyed by irradiation at a selected wave length of ultra-violet light, and the difference between a new measurement at  $328\text{ m}\mu$  and the original measurement allows one to calculate the vitamin A.

Riboflavin is determined on 15 cu. mm. of red blood cells. This is done by measurement of the rate of acid production by *Lactobacillus casei* in a medium in which riboflavin is the limiting nutritional factor for the bacteria. This method, previously developed by others, has been adapted to a micro scale.

Hemoglobin is measured on 10 cu. mm. of whole blood after dilution by light absorption in a photoelectric colorimeter.

These microchemical techniques offer an advantage not only in regard to the problem of procurement of specimens, but also in the rate at which the determinations can be performed. It should be pointed out that for some methods, instruments are used which cannot be

carried into the field. However, with present-day transportation methods, it is no longer necessary to plan to do all determinations in the field. One of us (O. H. L.) used the above described micro methods as part of a survey in Newfoundland. A kit weighing less than 100 pounds was all that was required in the field. Some determinations were made there, while other specimens were prepared for shipment in dry ice to the laboratory. Several weeks elapsed before certain determinations were done. This is made possible by preserving the specimen by freezing.

We are also using the micro methods for certain experimental studies on the physiology and biochemistry of the vitamins. Sufficient blood can be obtained repeatedly from a small experimental animal (i.e., 50 gm. rat) for analysis, whereas previously it was necessary to use pooled specimens from several animals in order to have sufficient material. Micro methods are of distinct advantage in studies of this type.

A full report on the results of the surveys in which the micro methods have been used is being prepared for



publication and, therefore, only a brief comment on this material will be made here. The analyses of large numbers of specimens offered no difficulties and proceeded with good economy of time. Likewise, the precision of analysis under such circumstances was satisfactory. Figures 1 and 2 summarize the results of determinations of ascorbic acid and hemoglobin on three groups of New York school children (A, B, and C) of different economic backgrounds, and illustrate how the methods can be used for group studies. Each group numbered about 75. Group A came from a high economic area of the city, group C from a very low economic area, and group B from an area of intermediate economic circumstances. The points on the vertical lines show the percentages of each particular group which had analytical values falling in the zone indicated by the figure at the base of the line; i.e., in Figure 1, 60 per cent of group A had plasma ascorbic acid levels of 1.5–2.0 mg. per cent while only 5 per cent of

those in group C had ascorbic acid values in the same range. Although there were no children in group A having an analysis below 0.4 mg. per cent (considered a subnormal level) there were 25 per cent of the children in group C below this level. It will be noted that a like distribution is also found for the hemoglobin determinations.

It is quite evident that there are measurable differences in the nutritional status of these groups. What these differences mean in terms of health is, of course, another problem. In this phase of the work the objective was to develop simple, practical, reliable chemical methods which would be helpful in measuring the nutritional status of large groups of children. We feel that a step in that direction has been made.

#### REFERENCE

1. National Research Council, *Bull.* 109, Nov., 1943. Report of Committee on Diagnosis and Pathology of Nutritional Deficiencies. Food and Nutrition Board. Inadequate Diets and Nutritional Deficiencies in the United States.

---

#### WANTED: BACK ISSUES OF THE AMERICAN JOURNAL OF PUBLIC HEALTH

Again the Central Office is sending out an SOS for *Journals* that are out of stock and which are especially needed now to complete sets for the countries that have been occupied and which now are requesting help in rebuilding their technical libraries. The *Journals* that can be used for this purpose are listed below:

- 1941—January, April, July, August
- 1942—January, March
- 1943—January, March, August, September, October, December
- 1944—June, August
- 1945—January, February, March, April

Members who can return any of the above *Journals* to the A.P.H.A. are requested to do so collect.

# Medical Coöperation with the Fort Greene Industrial Health Committee\*

CHARLES F. McCARTY, M.D.

*Director, Medical Activities, Kings County Medical Society, Brooklyn, N. Y.*

THE Fort Greene Industrial Health Committee is a coöperative venture of many agencies, and my part in this program is to describe the place of organized medicine in this committee. Without the wholehearted support of management, both its financial support and its assistance in forming Health and Safety Committees, we could not exist. Without the support and stimulation which we receive from labor and from all workers, we could not obtain results. The New York City Department of Health, through Commissioner Stebbins and Dr. Landes, has been our guide and sponsor. They have given us quarters for our office and they have helped us not only with advice but with materiel and with personnel in every way possible. The local and national health and social agencies have also played a large part in this work.

For many years, the Medical Society of the County of Kings has been particularly interested in teaching health to the general public. Members of our Society have given lectures on all types of health subjects before Parent-Teacher Associations, Mothers' Clubs, Union meetings, etc. We also have given one or more radio talks or radio dramatizations on health subjects weekly. In 1943 we were forced to discontinue much of this work because over 40 per

cent of the doctors in Brooklyn were in service and the others were busy with hospital and other work. Although we were unable to give as many health talks to the laity as we had been doing for years, it did not mean that our Public Health Committee or our Comitia Minora had lost interest in public health education. In 1941, our County Society established a Committee on Industrial Health with Dr. Irving Gray as Chairman. This committee gave a course on industrial medicine which was attended by about 80 physicians. To the best of our knowledge, this was the first course of its type ever given by a county society. The following year, the Long Island College of Medicine inaugurated its course on industrial medicine, and we felt that it was no longer necessary for us to continue this work.

As Director of Medical Activities of the Medical Society of the County of Kings, I was asked to act as Secretary of the Fort Greene Industrial Health Committee and, later, to help with the organization of its work. This request received the unanimous approval of the Comitia Minora, the governing body of our Society.

It is planned that the work of the Fort Greene Industrial Health Committee be carried on through local Health and Safety Committees in each of the participating firms. Dr. Landes and I, or either of us, have met with a great many Health and Safety Committees, or with representatives of firms

\* Based on a paper presented at a Joint Session of the Industrial Hygiene, Public Health Education, and Public Health Nursing Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

located in the Fort Greene area of Brooklyn, and have found that not only is management enthusiastic for our program, but the workers themselves are interested in health education. A typical Health and Safety Committee in a plant or store consists of a representative from management—usually the personnel director—representatives of the medical department—when the firm has such a department—and representatives from each group of employees; i.e., union representatives, supervisory staff, office staff, sales people, mechanics, maintenance departments, etc. On the whole, the firm physicians and nurses have been very enthusiastic and very helpful about our work.

These committees are expected to meet at regular intervals and discuss the health problems with that particular plant and store and to plan for the health education of the workers in the plant.

The Industrial Health Committee has engaged the services of a full-time, trained health educator whose prime duty it will be to see that these committees are organized and that they function.

We are planning an Institute for health and safety committee advisers. This Institute will be under the direction of Henry Ockerman of the Zurich Insurance Company, who has had a large experience in the organization and training of similar committees for his company. It is expected that this Institute will be attended by workers from the various cooperating health and social agencies, and that each worker will, after attending the Institute, assume the direction of one or more plant Health and Safety Committees. The health educator of the Fort Greene Industrial Health Committee will always be on call to assist with the organization of these committees and to give them advice in the planning of their programs.

We have endeavored to locate the sources of material available for the use of these committees in carrying out their program, and find that there are not many films available on health subjects which are suitable for lay audiences. For this reason, we welcome the idea of the health films which Dr. Landes has described to you.\*

We also find that many pamphlets and posters which have been available in the past can no longer be obtained. If we are properly to carry out this program of health education, the committee will probably be obliged to produce many additional pamphlets and leaflets on health subjects.

The Industrial Health Committee is planning to offer to the local committees from two to four health subjects a month as educational material. The Industrial Health Committee will provide speakers, posters, movies, and pamphlets as desired by the local committees on these subjects, and the subjects will follow, as nearly possible, the subject matter of the current tabloid.

The movies or talks are to be given during the lunch hour, after work, on time assigned by the company, or at union meetings. We are at present prepared to give talks on any medical or health subject which is requested, and movies and pamphlets on colds and pneumonia, tuberculosis, appendicitis, venereal disease, safety, cancer, and many others.

The Fort Greene District of Brooklyn is largely industrial, containing a few large industries, but they probably have more diverse small industries, many of which are directly engaged in war work, than any other similar number of square miles in the world.

Each of these industries has its own individual health problems. In many of the industries, most of the employees

---

\* Landes, Jacob. H. Plan of the Fort Greene Industrial Hygiene Committee, *A.J.P.H.*, 35, 6:602 (June), 1945.

are women. Many of the women employed in the candy industry, for instance, are married and have small children. In some of the others a large number of young girls are employed. In some small factories nearly all of the employees are older men who are skilled mechanics. The health problems in these various plants, stores, and factories, differ greatly. The laundry worker and the department store clerk have different health hazards, as do the workers manufacturing heavy machinery and those manufacturing light springs.

In order that the Fort Greene Industrial Health Committee can be of value to all workers in the area, its program must be fitted to the individual needs of the employees in each participating firm. Our first definite venture in health education for the worker while on the job was the tabloid, "Here's To Your Health." This tabloid is published twice a month and is distributed to each employee in the coöperating firms. In some firms, this tabloid is distributed with the plant paper, and in others, it is distributed by the guards.

During a recent month, we were led to believe that employees of coöperating firms were not reading the tabloid and, for this reason, we sent letters to fifteen coöperating firms asking whether they would be willing to sample about 5 per cent of their employees as to the employees' reactions to the tabloid. Ten firms stated that they would be willing to make the survey and to date replies have been received from six of these firms. We find from this that in the firms where the survey has been conducted, 86 per cent of the employees receive the tabloid. Of these, 91 per cent state that they read it, 48 per cent take it home to their families and their families read it, and 82 per cent feel that it is of real value. A few of the criticisms which we received are as follows:

"Causes of various ailments stressed, but not enough preventive or treatment explanations."

"I think a short article in each issue about some medical development would be interesting—say Rh Factor, Penicillin, or something of the sort."

"Seasonal subjects could be stressed with each issue, along with one general item."

"Physical benefits of exercises explained."

"Longer and more scientific articles."

"More facts on diets—reducing, gaining, and energy-building."

"More question and answer columns."

"More specific information on health and disease."

"Encourage contributions by readers."

The Industrial Health Committee has made plans by which x-rays may be taken of all employees in each coöperating firm. In firms having 100 or more employees, these x-rays will be made on the job by the Industrial Health Committee through the Brooklyn Tuberculosis and Health Association. These films will be read by physicians approved by Brooklyn roentgenologists, and the follow-up of suspicious cases and complete diagnosis will be made by the New York City Department of Health. In individual cases or in small firms, the x-rays will be taken either at the offices of the Brooklyn Tuberculosis and Health Association or in the Fort Greene Health Center. The Industrial Health Committee will report to the firm physician and to the employee all cases in which these films are negative. On those films which show pulmonary tuberculosis which is contagious, or pulmonary tuberculosis in which the employee should not work or should have his job changed, a report will be made to the employee, the firm physician, and to the employee's physician.

The Industrial Health Committee, through the information service of the Medical Society of the County of Kings, will inform any employee in need of medical care as to where he can obtain the services of a general practitioner or a specialist in his neighborhood, or, if he cannot afford to pay for these services, he will be informed as to free

services available. The Medical Society receives, at present, an average of twenty requests per day for information concerning where persons may receive medical care.

Dr. Landes mentioned the fact that in many of the firms which we have visited management is interested in planning for some type of medical service. All of the members of the committee feel that health education of the worker is not enough, and that medical care for the worker on the job and health advice in individual cases, must be made available. This advice and care should be given by doctors and nurses trained in industrial medicine and informed as to the needs of the individual plant.

The committee hopes that as soon as enough doctors return from the Army and Navy, we will be able to plan a medical service for small industry, to be paid for by industry on an hourly basis. The committee does not feel that medical problems or medical care not related to the employee while he is working are its function, but that home and hospital medical care are the functions of others.

It is my belief that with the support which we are receiving from management, from labor, from the Health Department, from the volunteer agencies, and from the medical profession, this venture in the education of the worker on the job will be a success.

---

## More Official Approval of the Control of Communicable Diseases

With the second large printing of *The Control of Communicable Diseases*, Sixth Edition, UNRRA's approval is added to the list of official acceptances of this important Report.

Its copyright page now carries, with the permission of the agencies involved, the fact that it is official with the U. S. Public Health Service and the U. S. Navy; has been approved in principle by the Surgeon General, U. S. Army; that the text of many of the diseases was prepared in agreement with representatives of the Medical Staff of the British Ministry of Health; that it has been recommended for adoption as an official statement by the National Health Administration of China; and that its epidemiologic information has been approved for distribution to the staff of UNRRA.

Ten state and three city health departments have adopted the Report and are distributing it over their imprints. In six states and as many cities, it is under consideration for adoption.

Chile is the first of the South Ameri-

can countries to accept it, with others soon to follow.

In Canada, the Dominion Council of Health has resolved "that the Federal Department of National Health and Welfare secure a sufficient quantity of the new publication for fairly wide distribution among public health personnel of the various Provinces. Each of the Provinces is to be permitted to insert one or more pages in the booklet, drawing attention to any variation in the regulations in force in that particular Province and those control measures that were suggested by the A.P.H.A. booklet." A formal declaration of approval by the Newfoundland Government has been received.

Nearly 100,000 copies of *The Control of Communicable Diseases* have been printed up to this time in English, 40,000 copies for the Office of War Information for use outside the United States. Accurate figures are not available for the foreign editions, Spanish, Portuguese, Italian, French, and Chinese, but will total well over 25,000.

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35

September, 1945

Number 9

C.-E. A. WINSLOW, DR.P.H., *Editor*  
LEONA BAUMGARTNER, M.D., *Associate Editor*  
ARTHUR P. MILLER, C.E., *Associate Editor*

MAZYCK P. RAVENEL, M.D., *Editor Emeritus*  
MARTIN FROBISHER, JR., Sc.D., *Associate Editor*  
JAMES E. PERKINS, M.D., *Associate Editor*

AUGUSTA JAY, *Editorial Associate*

## *Editorial Board*

REGINALD M. ATWATER, M.D.  
*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.  
KENNETH F. MAXCY, M.D.

HENRY E. MELENCY, M.D.  
ALTON S. POPE, M.D.

C.-E. A. WINSLOW, DR.P.H.

## THE PROBLEM OF AIR-BORNE INFECTION

THE major purpose of this *Journal* is to present new and significant advances in the public health sciences and in public health practice. It has, however, been the feeling of the Editorial Board that such concrete and specific material might well be supplemented by occasional articles of wider scope presenting background material and outlining broad trends in certain important fields. The leading article in the present issue is the first of a series of such special review articles to be prepared on the request of the Editorial Board.

In this contribution, Dr. J. E. Perkins discusses the vital problem of control of air-borne infections. It is of special interest that this review is prepared from the standpoint of one of our own subcommittees.

The contributions of the Wellses (and, independently, of Hart at Duke University) have made it abundantly clear that the problem of atmospheric dissemination of disease germs (particularly viruses, but also certain bacteria) is a real and important one. Issues of the *American Journal of the Medical Sciences* for last spring contain a wealth of material on this subject.

Here is a broad new field of environmental sanitation; and in this field there are two major questions to be answered.

First, in what places, and under what conditions, is the problem of infection by droplet nuclei of sufficient practical importance to warrant specific programs of control? The case seems reasonably clear for the operating room and the contagious disease ward. The Wellses' work indicates a field of sanitary ventilation beyond the hospital and strongly suggests that hazards in the school classroom (and presumably in the auditorium) may be sufficient to warrant control measures. General adoption of the theory must await a broadening of the base and deepening of the salient of experience since final decision on actual classroom procedure must await further epidemiological experimentation in the actual classroom; and it is gratifying that in New York State and other places carefully controlled comparisons are being made of disease incidence in protected and unprotected rooms.

The second question—where control of the microbic content of the air seems desirable—is, what methods are most effective and most economical? It has been

demonstrated that the use of either ultra-violet light or of aerosols may be highly efficient; and the treatment of floors and furniture (or bedding) with absorptive materials has also proved of value in reducing atmospheric pollution.

To arrive at sound engineering conclusions, three steps seem essential:

a. Standard laboratory methods for quantitative estimation of microbial pollution in the atmosphere must be agreed upon. It is encouraging that a joint meeting of the various committees mentioned by Dr. Perkins was held in June and arrived at substantial agreement on this point.

b. Extensive quantitative studies must be made in various occupied places, using identical and comparable methods, so as to provide a reasonably accurate standard (perhaps based on the number of hemolytic streptococci present) to distinguish a safe atmosphere from a dangerous one. Such a standard should be as basically useful as was the colon test in the evolution and testing of processes for purifying water.

c. Finally, such a standard must be applied under practical conditions to the testing of various procedures for the purification of the atmosphere so as to establish the quantitative efficiency and economy of each, in order to meet the old definition of the engineer as "a man who can do for one dollar what any fool can do for two."

It is fortunate that all the committees concerned, representing both the A.P.H.A. and the A.S.H.V.E., are coöperating closely in a program leading toward these common and essential ends. Their conclusions may well open the way to a new field of environmental sanitation of major importance to human health and welfare.

### A THIRD OF THE NATION WITHOUT HEALTH PROTECTION

THE Committee on Administrative Practice devoted its earlier efforts to the development of standards of procedure and personnel for a local health department of optimum adequacy. Such a department, costing \$2.00-\$2.50 per capita per year, is now in operation in many urban and a few rural communities; and experience has shown that the ideals of the committee were reasonable and sound. In recent years, through Dr. Haven Emerson's Committee on Local Health Units, the C.A.P. has given special attention to the problem of our more backward areas. It has reminded us that while we should still strive for even higher attainments in prosperous centers, we must not forget the crying need for bringing at least a minimum of modern health protection to our less fortunate fellow-citizens. A report by this committee on "Local Health Units for the Nation" published last month by the Commonwealth Fund is a document of primary importance. Its results are summarized in this issue of the *Journal* by Dr. Emerson and Miss Luginbuhl.

The committee finds that 40,000,000 of our people are still living "under sub-standard local health organization, ill-equipped to give basic minimum health protection." It suggests as an immediate goal, the extension to all areas in the United States of at least a minimum of health service including vital statistics and public health laboratory service, environmental sanitation, communicable disease control, hygiene of maternity, infancy and childhood, and health education—at a cost of \$1.00 per capita.

To attain this end, it is first of all essential to break away from our present archaic local political units and create new health areas, corresponding generally to counties or groups of counties, and of a size sufficient to make possible efficiency and economy of operation. Instead of the fantastic number of 18,000 local administrative health units now in operation, the committee proposes the creation of 1,197 units covering the entire country. Specific areas have been suggested for these units and have received approval, in principle, from the state health officers of all but two states. Eighty-six per cent of the suggested areas have populations of over 45,000 persons.

With such reasonable administrative districts, relatively modest appropriations would make possible minimum health service for all our people. In 1942, we were spending 77 million dollars for local health service, or 61 cents per capita; a minimum of 127 millions, or 97 cents per capita, is proposed by the committee. From the standpoint of personnel, the Emerson plan contemplates the entire elimination of over 4,000 part-time health officers and a slight reduction of full-time administrative medical personnel; with an addition to the present forces of 1,500 part-time clinicians, 13,000 public health nurses, 300 sanitarians, 3,700 clerical and statistical workers, 2,220 laboratory workers, 2,500 dentists (mostly part-time), 3,900 dental hygienists, and 500 health educators.

These figures provide only for minimum service and do not include the progress already made in those urban communities which are now spending more than 97 cents per capita—and the future progress which must be made in all communities toward the really adequate \$2.00 per capita service which should ultimately be attained. The report, however, presents a clear challenge to us to bring our less fortunate areas up to at least the minimum set by the Committee on Local Health Units. The present unevenness of health protective services in the United States is nothing less than a national disgrace. It contravenes our charter as a nation which recognizes the fundamental right of all Americans to life, liberty, and the pursuit of happiness; for life, liberty, and happiness require health as a prerequisite. -

## ACCREDITATION OF SCHOOLS OF PUBLIC HEALTH

DEMANDS for public health training are certain to be greatly increased when the war in the Pacific comes to its ultimate close. The proportion of physicians now in military service who will wish to enter the field of health administration may or may not be correctly represented by the results of an A.M.A. questionnaire published some months ago. It is clear, however, that the absolute number of such physicians will be sufficient to overtax seriously our available resources for sound basic training in public health. In addition, there will be many non-medical men whose military experience will lead them to consider careers in the field of environmental sanitation. Financial barriers to advanced training will be largely removed by the provisions of the G I Bill of Rights; and, in the granting of scholarship aid under this bill, the federal government will be faced with the responsibility of insuring that the federally-supported student gets his money's worth.

To meet these needs for postgraduate education, we have a small number of well equipped schools of public health, whose procedures have been developed,



individually and experimentally, during the past quarter-century to the point where a considerable agreement on an adequate and balanced program has been reached. We are also, however, faced with other institutions—in larger numbers—which offer courses in public health without adequate programs or competent faculties. Some of these institutions are honestly striving to meet a need with limited resources. Some are merely seeking to attract students by deliberately and grossly misleading prospectuses.

It is, therefore, urgently necessary to establish reasonable standards for institutions which may safely be entrusted by the federal government with the serious responsibility of training its temporary wards—to protect the student from exploitation and the public against incompetent service by inadequately trained personnel. Such standards would also be of great value to foundations and individuals providing aid for public health training; to appointing boards and administrators in the evaluation of the qualifications of candidates for posts; and to the educational institutions themselves in the improvement of their curricula and in securing financial support for such improvement.

In recognition of this need, the American Public Health Association has been invited by the two agencies most vitally concerned with this problem to undertake a program for the accreditation of institutions which may be considered as competent to offer courses of postgraduate training in public health. The Committee on Post-War Training of Public Health Personnel appointed by the Surgeon General of the United States Public Health Service at a meeting last April reaffirmed a former request to the Association to undertake this important task. An identical request was made in the same month by the Association of Schools of Public Health, representing the leaders in this field of university education.

Since 1942<sup>1</sup> the Committee on Professional Education, under the chairmanship of Dr. W. P. Shepard, has had this subject under consideration; and it is gratifying to announce that funds for undertaking the task involved have now been provided through the generosity of the Commonwealth Fund of New York City. The committee expects to get to work at once and hopes before the end of the present calendar year to present a preliminary list of certain institutions which are clearly qualified to provide courses leading to the M.P.H. degree.

In undertaking this work, the committee is keenly aware of the dangers of over-standardization. In the complex field of public health, any such crystallization of courses and hours as is now in force in medical education, would be most unfortunate. It is essential, however, that certain basic requirements should be met with regard to such criteria as reasonable independence of administration, budget, number and qualifications of faculty, admission requirements, general scope of curriculum, library and laboratory facilities, and opportunities for such field experience as falls within the scope of a basic year's training in public health. (Training in the field, following or preceding the first year's course [corresponding to a hospital residency] is a question to be considered separately and a problem for the health departments rather than the schools.)

Accreditation will be based on the submission by any institution applying for recognition of an appropriate questionnaire and on a visit to the institution by a representative of the committee. A copy of the report of the staff will be submitted to the administrative head of the institution before submission to the Committee on Professional Education, and the committee will provide a hearing to him or his representative if desired. Decisions of the committee will be finally subject to approval by the Executive Board of the Association. In certain cases,

provisional accreditation may be granted, subject to the fulfillment of specified requirements within a stated time.

It is planned to concentrate first on the basic one year of training qualifying for the degree of Master of Public Health (in Canada, Diploma of Public Health). At the same time, or subsequently, a list of institutions will be accredited for the more advanced degree of Doctor of Public Health, perhaps involving specialization in particular administrative or clinical fields. The actual content of the second year would obviously not be uniform.

At a later date, it is planned to extend the program to consideration of facilities for M.P.H. training adapted to particular specialties such as health education; to such general university degrees as the M.S. and the Ph.D., which are given without specific designation but with specialization in basic areas related to public health (such as bacteriology or statistics); to specialized degrees in engineering and other fields related to public health; and to administrative areas suitable for practical field training before or after the basic M.P.H. year.

This is a large and a responsible task; and the Association bespeaks a maximum of patience on the part of fund-granting, educational, and administrative authorities. Requests for a list of institutions accredited for certain specialties have already come to the Association, which cannot be met without months of study. We are building for a long future, and the groundwork must be firmly laid.

#### REFERENCE

1. Minimum Educational Facilities Necessary for the Postgraduate Education of Those Seeking Careers in Public Health—Adopted by the Committee on Professional Education, *A.J.P.H.*, 32:533 (May), 1942.

## RECORDS

THERE are few functions of the health department, or the Visiting Nurse Association, which are so commonly a cause of complaint as that of record keeping. To both doctor and nurse "paper-work" is commonly a *bête noire*. Yet they know that a fever chart or a graph of annual disease incidence is something more than "paper-work." It means something to them. It is an inextricable part—an essential condition—of the work they are doing. All records which deserve to be kept at all are, for someone, essential to efficiency. But the person who makes the original entry does not always realize this important fact.

Records are *not* a necessary evil. They should be beacons that light the way. A physician cannot be expected to treat a syphilis case from memory. A nurse cannot carry in her mind the varying patterns of households. Nor can a sanitarian remember all the things that went on before on various premises. Notices must be sent out. Names and addresses must be recorded. Expenses must be jotted down. Memoranda of conversations and decisions at meetings must be noted. They may be as significant in the evaluation of community opinion as is the chart of a sound child's growth an index of its health.

We can't escape making records—nursing, sanitary, clinic, school, financial; but we can be discriminating in what we record. Records are only valuable if they are useful—and if they are used. Periodic review of records should be an essential factor of good health administration.

What item is useful, what is not? What item is rarely filled out? These are not insignificant details. It is startling to visualize the total staff time spent in keeping records. We recall the choice example of a record form—several large

sheets consuming two weeks of a clerk's time to fill out monthly—that was still being faithfully made out three years after the person who asked for it had died. It was being filed regularly but no one used it. No one could recall what it was for. It was an activity lost from sight in the dim mists of unreviewed routine.

There is pay-dirt in record reviewing. It is the key that opens the door to accomplishment. Ten unnecessary items filled in daily by ten nurses mount up in time consumed. A slight change in form may change a dead item to a live bit of useful information. Does the record give the type of data that helps in guiding the program? Is it useful in supervision? Is an item presented in such form as to be reliable?

The size and the form of the record card may be of fundamental importance. We recently noted that the health department in a certain city used two different forms for the record of each tuberculosis case, both of awkward and unusual size, and neither of much value without reference to the other. The Visiting Nurse Association of this city had all the essential data on two sides of a standard size card.

The tabulation of data noted on records is another essential factor—sometimes neglected, sometimes carried out as a dead and meaningless routine. We should ask ourselves here: What tabulations are necessary? How often should they be made? Do we need to tabulate a whole drawer full of cards? Have we experimented with short cuts or sampling? Will 25 cards here, 25 there, and 25 from a third place give essentially the same answers as tabulation of the whole 500 cards? Sampling is not, of course, suitable in determining total volume or in dollar and cent transactions but it is often useful in revealing distribution and relative frequency in many fields of public health activity.

We are inclined to believe that periodic review of records and their uses is a basic administration responsibility and that the person assigned to this task—not necessarily a super-statistician—should occupy a key position in the health staff household. The student of record methods and record uses, has a much bigger part to play than we have hitherto recognized.

This function should be borne in mind, not only in the health department but also in the school of public health. Are such matters teachable? Have they been given weight in our schools of public health? These problems crop up every day. They are endemic, as every health officer knows. Haven't they a place alongside such technical subjects as epidemiology, municipal sanitation, and bacteriology?

# Examination of Water and Sewage\*

## Laboratory Section

SINCE the submission of the completed manuscripts on the microscopy and bacteriology of water and sewage last year to the Editorial Committee, your committee has been interested primarily in further studies of the bacteriology of water as it pertains to standards of analysis.

Mr. McCrady, referee on bacteriological methods reports as follows:

"There has been a marked paucity of contributions to the literature of bacteriological methods of water examinations during the past year or two. Laboratory workers have had little time for any but the most essential and pressing research work.

Perhaps the most interesting recent contributions have been the development of a new medium for the detection of *Streptococcus fecalis*,<sup>1</sup> by Hajna and Perry, and a report by the same observers<sup>2</sup> on a further evaluation of the so-called "E C" medium, a buffered tryptose lactose bile preparation by Perry,<sup>3</sup> and Hajna and Perry<sup>1</sup> for detection of the presence of coliform organisms by incubation at 37° C. and of *Escherichia coli* by incubation at 45.5° C.

The new "S F" medium for *Streptococcus fecalis* employs sodium azide (1-2,000) to inhibit Gram-negative organisms and a selective incubation temperature of 45.5° C. It is stated to be highly specific for fecal streptococci,

growth in the medium and an acid reaction constituting almost complete evidence of the presence of *S. fecalis*. It will be recalled that Mallmann<sup>4</sup> suggested a similar medium for use at 37° C. for detection of the presence of streptococci; he used sodium azide in the proportion of 1:5,000.

In the further evaluation of the E C medium variable results were obtained by the eleven participating laboratories; one group of five reported that the E C medium at 37° C. gave results as good or slightly better than those yielded by lauryl sulfate tryptose broth,<sup>5</sup> but the reports from the other group of six laboratories were not so satisfactory. Similar variable results were obtained when using the medium for detection of *E. coli* with incubation at 45.5° C. They compared very favorably with the results secured from the use of these authors' modified Eijkman medium; but although five laboratories reported very few false gas-positives with either medium, the other six laboratories reported 16-17 per cent with both. The authors conclude that both the E C and the lauryl sulfate broth are highly efficient in the isolation of the coliform bacteria and that E C medium is somewhat more specific.

In an attempt to determine the value of this medium when used in the examination of Quebec waters, a series of 28 samples from a variety of sources was

\* Report of the Standard Methods Committee.

STANDARD METHODS COMMITTEE ON EXAMINATION OF WATER AND SEWAGE

Organized 1899. Reorganized 1933. Published reports: *Year Books* 1930-1931, 1934-1935, 1935-1936, 1937-1938, 1939-1940, 1941-1942, *A J.P.H.*, May, 1943, Aug., 1944. 8 volumes published: 1905, 1912, 1917, 1920, 1923, 1925, 1933, 1936.

examined by Dr. J. Archambault in the laboratories directed by your referee, employing lactose broth, lauryl broth, and the E C medium. Of 195 lactose broth gas-positives, coliforms were isolated from 115; of 172 lauryl broth gas-positives, they were isolated from 129; and of 153 E C gas-positives, they were isolated from 111. In other words, lauryl sulfate broth yielded approximately 16 per cent more coliforms than did E C medium. As regards specificity, coliforms were isolated from 75 per cent of the lauryl sulfate broth and 72.5 per cent of the E C gas-positives. In the examination of this series of samples, therefore, although these two media appeared to possess practically the same specificity, lauryl sulfate broth proved to be somewhat the more sensitive.

Perry and Hajna suggest that small bubbles of gas in enrichment tubes be ignored because they may be due to air in the medium or to other accidental causes. Since it is feasible, with care, to eliminate such false positives, and since coliforms are frequently isolated from enrichment tubes showing small bubbles of gas, rejection of such tubes does not appear to be wholly warranted.

It will be interesting to know the experience of other observers who experiment with these two media.

There has been some criticism of the high cost of lauryl sulfate broth due to the increased concentration of peptone. A study was made by Mallmann and Gilmore<sup>5</sup> to determine the amount absolutely necessary to give maximum growth of coliforms. They found that there was little difference in the growth rates of coliform in 1.5 and 2 per cent concentrations of tryptose. The 2 per cent concentration gave the best results. One per cent concentrations were definitely inferior. The writers recommend that a 2 per cent concentration be used as previously recommended by Darby and Mallmann.<sup>6</sup>

Mallmann and Gilmore<sup>5</sup> also studied

the stimulatory effect of 0.5 per cent concentration of sodium chloride in standard lactose broth. It was found that the addition of sodium chloride increased very materially the growth rates of coliforms. The growth rates attained were very much the same as those obtained with lauryl sulfate broth. Field studies should be made with a 0.5 per cent NaCl lactose peptone broth, in comparison to standard lactose broth. By the further addition of lauryl sulfate, it is possible that a very satisfactory medium would be available that would compare favorably with lauryl sulfate broth.

Gilcreas reports the need of a better method of determining grease in sewage analysis. He reports that methods for grease determination will be conducted during the coming year.

Several members of your committee are engaged in war work which has prevented them from active participation in work on standard methods in their respective fields.

W. L. MALLMANN, PH.D., *Chairman*,  
Michigan State College, East Lansing,  
Mich.

A. M. BUSWELL, PH.D.

F. WELLINGTON GILCREAS

MAC H. MCCRADY

M. STARR NICHOLS, PH.D.

THEODORE A. OLSON

LELAND W. PARR, PH.D.

JOHN T. TRIPP, PH.D.

#### REFERENCES

1. Hajna, A. A., and Perry, C. A. Comparative Study of Presumptive and Confirmative Media for Bacteria of the Coliform Group and for Fecal Streptococci. *A.J.P.H.*, 33:550, 1943.
2. Perry, C. A., and Hajna, A. A. Further Evaluation of E C Medium for the Isolation of Coliform Bacteria and *Escherichia coli*. *A.J.P.H.*, 34:735, 1944.
3. Perry, C. A. A Summary of Studies on Pollution in Shellfish—*Escherichia coli* versus the Coliform Group as an Index of Fecal Pollution and the Value of a Modified Eijkman Test. *Food Research*, 4:381, 1939.
4. Mallmann, W. L. A New Yardstick for Measuring Sewage Pollution. *Sew. Works J.*, 12, 875, 1940.
5. Gilmore, Eleanore. Further Studies on Media for Coliform Bacteria. M.S. Thesis. Mich. State College, 1944.
6. Mallmann, W. L., and Darby, C. W. Uses of a Lauryl Sulfate Tryptose Broth for the Detection of Coliform Organisms. *A.J.P.H.*, 31:127, 1941.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**Manual of Tropical Medicine—**  
*By Colonel Thomas T. Mackie, M.C., A.U.S., Major George W. Hunter, III, Sn.C., A.U.S., and Captain C. Brooke Worth, M.C., A.U.S. Philadelphia: Saunders, 1945. 727 pp., 287 illus., 6 in color. Price, \$6.00.*

This manual produced with the collaboration of the staff of the Army Medical School is intended to provide a concise statement of the most recent available and authoritative information on tropical diseases. This has been accomplished in an excellent manner, and, although it cannot supplant larger textbooks, its wide scope, clear exposition, and excellent illustrations place it in the forefront of the one-volume texts in this field.

Sections of the book are devoted to diseases caused by all of the groups of infectious agents from viruses to helminths, and there are sections on nutritional diseases, arthropods and diagnostic methods. There are 18 original drawings of life cycles, protozoa, helminths, and arthropods; and excellent photographs and colored plates have been furnished by the Army Medical Museum, the National Institute of Health, the Army Medical School, and other individuals and publishers. Maps of geographical distribution have been furnished from the Army. There are also many tables of vectors and their distribution, summaries of disease transmission, and keys to the identification of parasites and vectors.

One cannot expect, however, that such a volume will be uniformly excellent. One of the weak spots is the treatment of amebiasis which the re-

viewer hopes will be improved in a later edition. There is also insufficient emphasis on the details of prevention of some diseases, particularly in view of the fact that the book is intended for use in military forces. The authors are to be congratulated upon a splendid accomplishment, particularly in view of their arduous responsibilities in training medical officers in tropical medicine. The publishers are also to be congratulated on an excellent product. This book should be in the hands of everyone concerned with tropical medicine, and can well be used as a textbook for medical students both in tropical medicine and parasitology.

HENRY E. MELENEY

**Tropical Medicine—***By Sir Leonard Rogers, M.D., and Sir John W. D. Megaw. (5th ed.) Baltimore: Williams & Wilkins, 1944. 518 pp. Illus. Price, \$6.50.*

This book has been written primarily for the general practitioner in the tropics who has available only the usual simple laboratory facilities. The laboratory methods used in diagnosis are given, and clinical diagnosis is stressed, and practical therapy most ably discussed from a large background of experience. The illustrations are not abundant and are of average quality. There are numerous maps showing the distribution of various diseases with their distribution in India especially stressed. The authors have purposely kept this volume small but in so doing have omitted discussion of infections by such important parasites as *Ascaris*, *Clonorchis*, *Sarcoptes*, and

others. The inherent value of this book so overwhelm these shortcomings, however, that it is still a very useful book not only for the general practitioner but also for military medical officers.

H. W. BROWN

**Doctors at War**—*Edited by Morris Fishbein, M.D.* New York: Dutton, 1945. 418 pp. 82 illus. Price, \$5.00.

This book is a record of heroism and accomplishment. It is authoritative and bears eloquent testimony to the work of the military medical services. Under the stress and dire needs of war, new methods and procedures, both in treatment and prevention, were accomplished in a remarkable manner, often in the face of extreme difficulties. The various theaters of operations were the testing grounds of medical science.

Without minimizing in the least any of the chapters of this extraordinary book, the chapter on "Preventive Medicine" stands as a monument of achievement. "Plasma," "penicillin," and "DDT" are already familiar terms whose implications are becoming more and more evident to everyone.

The book is well written and is all meat. It should be on the desk of every public health worker.

ANTHONY J. LANZA

**The Attendant's Guide**—*By Edith M. Stern in collaboration with Mary E. Corcoran.* New York: Commonwealth Fund, 1945. 104 pp. Price, \$.50.

Like *Mental Illness: A Guide to the Family*, this little book by the same author and from the same publisher, is unique. It fills a need of such long standing that a widespread demand for it is a foregone conclusion.

Very simply and clearly, this "Guide" supplies information about the duties, attitudes, and knowledge expected of an attendant in a mental hospital. It is not a "procedure book" in any sense, but an authentically work-

able, readable, long needed explanation of the attendant's place in the care of mental patients. It dignifies that place and gives it rightful recognition.

Student and graduate nurses entering the mental hospital for the first time will be wise to read this little book, not only to gain understanding of the attendants' work, but because the "Guide" contains so much about the behavior of the mentally ill and the conditions surrounding their care, that they will be the better nurses for that knowledge.

The book marks a milestone on the road to much needed improvement in the attendant service for the mentally ill.

DOROTHY DEMING

**Vital Statistics Directory**—*Compiled by the Vital Statistics Section of the A.P.H.A. (3rd ed.)* New York: A.P.H.A., 1945. 33 pp. Price, \$.75.

The Membership Committee of the Vital Statistics Section of the American Public Health Association, of which Dr. A. W. Hedrich is Chairman, has endeavored to include in this Directory "the names of all qualified persons active in the collection, publication, analysis or supervision of public health statistics." This has been a difficult undertaking and Dr. Hedrich, the Committee, and their assistants are to be commended on the successful completion of this *Directory*.

This *Directory* will be useful to members of the Section, to those concerned with several phases of the work of the Vital Statistics Section, and to administrators and others interested in vital statistics work.

Since the field of "qualified persons . . . in public health statistics" is difficult to define, this *Directory* has many types of workers. Professors, associate and assistant professors, statisticians, social science and public health analysts, public health representatives, registrars and deputy registrars, directors and

chiefs of divisions, actuaries, sanitarians, statistical and other clerks, and workers designated by numerous other titles are included.

The distribution of the 885 persons listed reveals an interesting situation. New York State (including New York City) had the largest number of persons employed at present, 162, with the District of Columbia second with 148. Six other states had 20 or more persons included: namely, California, 37; Illinois, 49; Michigan, 25, Minnesota, 20; New Jersey, 26; and Ohio, 34. Ten states, Connecticut, Kentucky, Maryland, Massachusetts, North Carolina, Pennsylvania, Tennessee, Texas, Virginia, and Wisconsin, had 10 to 19 persons listed. The remaining 31 states had less than 10 persons known to be active in the collection, publication, analysis or supervision of public health statistics. With the extension of public health work it is hoped that professional statistical workers will be available and will be used in all fields of public health and in all areas of the United States

RUTH R. PUFFER

**Malaria in the Upper Mississippi Valley 1760-1900. Supplement No. 4 to the Bulletin of the History of Medicine—By Erwin H. Acherknecht. Baltimore: Johns Hopkins Press, 1945. 142 pp. Price \$2.00.**

This study deals particularly with the five states that lie partially in the Mississippi Valley above the mouth of the Missouri River, namely, Illinois, Missouri, Iowa, Wisconsin, and Minnesota. "The Upper Mississippi Valley was chosen for examination as a region where malaria, after having been once very prevalent, had disappeared spontaneously long before the introduction of any systematic antimalarial measures; and where, therefore, new insight into the mechanism of the rise and fall of malaria might be gained."

The monograph is characterized in

the preface as "foremost an epidemiological study." It is much more than this, however. The author, with clear purpose, has combined the patient methods of historical research and documentation with clean-cut epidemiological reasoning and summarization; and with courage and imagination he interprets his material pro and con and states definite opinions even when they involve controversial points on which decisive data are not available.

The term "disappearance" designates a death rate of 1 or less per 10,000 population. Attempts to make the study quantitative as well as qualitative were largely defeated by the scarcity of morbidity or mortality data for that period. In addition to the well known reasons for incomplete reporting of malaria, "historians have the fatal tendency to write the history of doctors rather than the history of medicine and disease"; and malaria "was so common that by many it was no longer regarded as a disease at all and therefore, of course, not recorded as such"—"He ain't sick, he's only got the ager."

The results of the study cannot be summarized in a brief review. The introduction discusses the shortcomings of malaria records and early theories of the cause of malaria. The study is in two main parts. The first is a historical account, state by state, of "The Rise and Fall of Malaria in the Upper Mississippi Valley" and a review of the epidemiology of malaria in this region as compared to other parts of the United States. All useful sources that could be located are reviewed and cited, the information for each state is summarized and illustrated by charts, and the text is enlivened and clarified by numerous brief quotations.

The second part of the study is entitled "Possible Factors for the Disappearance of Malaria from the Upper Mississippi Valley." Of 12 factors examined none can be singled out as



the main or exclusive agent. Stopping of population movement, shifting of settlements inland (from the rivers), better housing, and increase in wealth seem to have acted in all five states. Cattle breeding appears to have had an enormous influence in Iowa, Wisconsin, and Minnesota. Only in Illinois and a limited area in Missouri did drainage, as an isolated factor, play a certain rôle. In a brief epilogue, the author argues that social factors—poverty, ignorance, and indolence—are sustaining causes rather than direct results of malaria prevalence; and that the incentive and resources for progress, as exemplified in this region, act indirectly but powerfully to subdue malaria and to promote regional development in spite of it.

Although primarily factual and not light reading, this book is extremely interesting and informative for anyone who reads it carefully. For those in general health work and for casual readers it gives a vivid and authentic picture of the scourge of malaria during colonization of these five northern states. For physicians, and others who are more directly concerned, its collection of authoritative opinions and about 235 selected references presenting both sides of fundamental questions should prove useful in work with or further study of malaria problems. Two minor disadvantages are lack of an index which impairs the value of the book as a reference text and its light paper cover which will not withstand frequent usage.

ROY J. MORTON

**Science Year Book of 1945—**  
*Edited by John D. Ratcliff. New York:*  
*Doubleday Doran, 1945. 224 pp.*  
Price, \$2.50.

**Science Today & Tomorrow—**  
*By Waldemar Kaempffert. (2nd series)*  
*New York: Viking, 1945. 279 pp.*  
Price, \$2.75.

**Science in Progress—***Edited by*  
*George A. Baitsell. (4th series) New*

*Haven, Conn.: Yale University Press,*  
1945. 331 pp. illus. Price, \$3.00.

We are told again and again that ours is the age of science. But what kind of science? Many persons believe in science today as they once believed in religion. Popular writers are teaming up science with "Magic," "Miracles," "Marvels," and even "Romance." They report on the "progress of science" as if there were no retrogression at all. The extent to which people believe in science is gratifying, but the picture they get of the scientific worker in movies, over the radio—not to mention the comic strip—is as far removed from reality as the sun is from the earth.

There are, of course, science writers who present a true picture. A well balanced selection of science stories from magazine publications has been made by John D. Ratcliff. A quarter of his *Science Year Book of 1945* deals with medicine. Most of the articles are taken from *Colliers*.

Waldemar Kaempffert deals mainly with the impact of science (and technology) on society, especially in relation to war. The chapter on "Sick medicine needs a doctor" will interest public health workers but it limits the discussion to the question of *how* and *how much* doctors should be paid.

*Science in Progress* is a series of reports made by the investigators themselves. They are not easy reading but are full of very interesting new approaches and findings. Walter R. Miles' Psychological Aspect of Military Aviation is especially recommended. Excellent photos illustrate the article on Structure and Action of Nerve Cells, by Detlev W. Bronk. Otto Loewi definitely terminates the old analogy of the nervous system and the telephone system in Chemical Transmission of Nerve Impulses.

Vitamins in mass production and vacuum chemistry go hand in hand.

K. C. D. Hickman's chapter on this subject is well illustrated and a masterpiece in the use of the King's English for describing understandingly such complicated matters as a "molecular still," and the pro—(and this is new)

and postvitamines. We cannot forget his basic statement, "All human experience is complicated by the presence of air." *Science in Progress* is a selection of the Scientific Book Club, a very good one. BRUNO GEBHARD

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**When Health Department Nurses Give Bedside Care**—If, as the unnamed writers of this report predict, more and more health departments see the need of administering complete nursing programs including bedside care, then all of us should be interested in the eleven basic conditions listed and discussed.

ANON. Administration of Home Nursing Care of the Sick by Health Departments. Pub. Health Nurs. 37, 7:339 (June), 1945.

**Interesting Negative Finding**—From a study of parents of polio victims, *no* evidence is found to suggest that paralytic cases tend to occur among the offspring of parents lacking circulating antibodies against the infection.

ARMSTRONG, C., and DAVIS, D. J. Studies on Susceptibility to Poliomyelitis. Pub. Health Rep. 60, 25:710 (June 22), 1945.

**Toward Better Schoolchild Health**—How Detroit strives to stimulate the interest of practising physicians in the schoolchild's health, how children are induced to live as well as know the essentials of hygiene, and how school buildings are made healthful places are the burdens of this discussion.

BLANCHARD, V. S. School Health Problems. Canad. Pub. Health J. 36, 6:217 (June), 1945.

**Is This a Novel Idea?**—Or have I been dozing? A British researcher had toxoid made into pastiles and in-

duced volunteers to suck four a day for seven days. Two weeks later, when they were bled, the circulating antitoxin was found definitely increased over the pre-treatment level. He does not propose the method for primary immunizations, but believes that it will prove useful for booster doses for adults who might have unpleasant reactions from the usual injections.

BOUSFIELD, G. Restoration of Diphtheria Immunity without Injections. Brit. M. J. 4406:833 (June 16), 1945.

**Yeoooh Spelled Backward**—Transcripts of radio commercials about four groups of products: improvement of skin, hair, teeth; respiratory organs; digestive and excretory functions; and pain relief and general health. Opinions were asked of experts, teachers, graduate students, and laymen. A negative relationship between educational status and acceptance of radio advertising was reported—which can scarcely be wondered at.

DUNCAN, G. I., and LUND, F. H. The Validity of Health Information Gained through Radio Advertising. Research Quart. 16, 2:102 (May), 1945.

**Organized Care for "Premies"**—In addition to the usual considerations of feeding and keeping the premature baby clean and warm, this article discusses the psychological aspects of the relationship of mother and "premie." Others than nurses—for whom the paper

was prepared—could do with a little understanding of this subject.

DUNHAM, E. C. Progress in the Care of Premature Infants. *Am. J. Nurs.* 45, 7:515 (July), 1945.

**Bowlegs and Knock-knees**—Is severe rickets still a major worry to child hygienists? If so, they will be interested in this study of what happened to ten babies with marked rachitic deformities when the children had grown up.

DUNHAM, E. C., and THOMS, H. Effects of Severe Rickets in Early Childhood on Skeletal Development in the Adolescent. *Am. J. Dis. Child.* 69, 6:339 (June), 1945.

**Dogs and Polio**—In several epidemics the possibility of animal reservoirs for polio has been studied. In one, a related virus was recovered from a mouse caught in a house sheltering a case. Other natural occurrences of poliomyelitis-like viruses have been reported. Sera from 3 of 37 dogs taken during the Chicago epidemic in 1943 were found to neutralize virus, which indicates the possibility that "man's best friend" may be susceptible, too.

GORDON, F. B. The Neutralization of Poliomyelitis Virus by Dog Serums. *J. Infect. Dis.* 76, 3:198 (May-June), 1945.

**Floating Streptococci in Hospital Wards**—Triethylene glycol vapor, to be most effective in suppressing airborne pathogenic bacteria in hospital wards, should be accompanied by dust and lint control measures. Two papers.

HAMBURGER, M., JR., *et al.* The Effect of Triethylene Glycol Vapor on Air-Borne Beta Hemolytic Streptococci in Hospital Wards. *J. Infect. Dis.* 76, 3:208 (May-June), 1945.

**It Pays to Remove Tonsils**—Tonsillectomies are relatively rare in certain low-income farm families covered in a survey—only 5 per cent of white, and 3 per cent of colored children having been operated upon. Recommendations for the removal depend

upon who does the inspecting and, apparently, the economic status of the inspectee.

GOVER, M., and YAUKEY, J. B. Physical Impairments of Members of Low-Income Farm Families—11,490 Persons in 2,477 Farm Security Administration Borrower Families 1940. *Pub. Health Rep.* 60, 25:693 (June 22), 1945.

**Promise of Good Things to Come**—What DDT sprayed on the walls did to 10,000 anopheline mosquitoes liberated in a test house shouldn't happen to a gnat! Oh for the day when the army releases the boon for the rest of us.

METCALF, R. L., *et al.* Observations on the Use of DDT for the Control of *Anopheles quadrimaculatus*. *Pub. Health Rep.* 60, 27:753 (July 6), 1945.

**Who Wants Health Insurance?**—Organized labor, say these writers, is the agency chiefly responsible for the growing call for compulsory health insurance, and the demand is most vocal in metropolitan centers. In New York and California, the wealthiest states with the greatest per capita supply of physicians, bills to create medical facilities are most numerous. In states, like Mississippi, where medical care is thinly spread, least is heard about provisions for it.

STROW, C. W., and HERSHFELD, G. Health Insurance. *J.A.M.A.* 128, 12:871 (July 21), 1945.

**Are Our Sights Set Too High?**—Surveys of "normal" Canadian diets indicate that with two exceptions—those of sedentary men and girls of 16–20—they are much lower in calories than the "Recommended Allowances."

VIRTUE, R., and MCHENRY, E. W. Comparison of Observed Intakes and Recommended Allowances of Calories. *Canad. Pub. Health J.* 36, 6:240 (June), 1945.

**Athlete's Foot**, *et al.*—One sentence, from a long conclusion to this paper should tell you whether or not

you will need to read it all. "Foot baths (hypochlorite and hyposulfite) are becoming discredited."

WEIDMAN, F. D., *et al.* The War and Dermatophytosis. J.A.M.A. 128, 11:805 (July 14), 1945.

City Life and TB—Among adult males, tuberculosis mortality increases directly with the size of the community,

but among females the rate decreases. In rural areas there is only a slight difference between the sexes. There are other findings of this statistical analysis which shall not be spoiled for you by being quoted here.

YERUSHALMY, J., and SILVERMAN, C. Tuberculosis Mortality in Communities of Different Size. Am. Rev. Tuberc. 51, 5:413 (May), 1945.

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.*

COMING HOME. New York: Metropolitan Life Insurance Co., 1945. 23 pp. Free from publisher, 1 Madison Ave. New York 10. N Y

HAROTE HAIVRI. The Hebrew Medical Journal. Volume 1, 1945. Edited by Moses Einhorn, M.D. New York: The Hebrew Medical Journal, 1945. 256 pp. Price, \$1.60.

INJURY AND DEATH OF BACTERIA BY CHEMICAL AGENTS. By Otto Rahn. No 3 of the Biodynamica Monographs. Normandy, Mo.: Biodynamica, 1945. 183 pp. Price, \$3.60.

INTELLIGENCE AND ITS DEVIATIONS. By Mandel Sherman, M.D. New York: Ronald Press, 1945. 286 pp. Price, \$3.75.

A MANUAL OF THE ASPERGILLI. By Charles Thom and Kenneth B. Raper. Baltimore: Williams & Wilkins, 1945. 373 pp. Price, \$7.00.

THE MUNICIPAL YEAR BOOK, 1945. The authoritative resume of activities and statistical data of American cities. Editors. Clarence E. Ridley and Orin F. Nolting. Chicago: International City Managers' Association, 1945. 603 pp. Thumb indexed. Price, \$8.50.

MY SAFETY AND FIRST AID-BOOK. By Leslie W. Irwin, Ph.D. New York: Lyons and Carnahan, 1945. 185 pp. Price, \$.72.

PSYCHIATRY IN MODERN WARFARE. By Edward A. Strecker, M.D. and Kenneth E

Appel, M.D. New York: Macmillan, 1945. 88 pp. Price, \$1.50.

POOR MAN'S DOCTOR. By Lewis R. Tryon, M.D. New York: Prentice-Hall, 1945. 233 pp. Price, \$2.75.

PULMONARY TUBERCULOSIS IN THE ADULT. Its Fundamental Aspects. By Max Pinner, M.D. Springfield, Ill.: Thomas, 1945. 579 pp. Price, \$7.50.

A RATIONAL EXAMINATION OF STREAM POLLUTION ABATEMENT. By Richard D. Hoak. Reprinted from *Science*, May 25, 1945. Pittsburgh: Mellon Institute of Industrial Research, 1945. 8 pp. Free from publisher, University of Pittsburgh, Pittsburgh 13, Pa.

SCIENTIFIC SOCIETIES IN THE UNITED STATES. By Ralph S. Bates, Ph.D. New York: Wiley, 1945. 246 pp. Price, \$3.50.

SCIENCE. THE ENDLESS FRONTIER. A Report to the President by Vannevar Bush. Washington, D. C.: Government Printing Office, 1945. 184 pp.

SOLVING CAMP BEHAVIOR PROBLEMS. Individual Guidance in Group Work. By J. Kenneth Doherty. New York: Association Press, 1944. 62 pp. Price, \$.50.

WAR RESEARCH AT MELLON INSTITUTE, 1944-5. Reprinted from *Science*, May 18, 1945. Pittsburgh: Mellon Institute of Industrial Research, 1945. 8 pp. Free from publisher, University of Pittsburgh, Pittsburgh 13, Pa.

## ASSOCIATION NEWS

### STATE PUBLIC HEALTH MEETINGS: 1945 PATTERN

As announced in the May issue of the *American Journal of Public Health* (page 536) a series of state health meetings under the auspices of state public health associations was arranged in several of the central and mountain states during May and early June, and was attended by a team of speakers organized under the auspices of the American Public Health Association. This circuit followed to a considerable extent the pattern of 1943 and 1944 for wartime meetings and had been approved by the Executive Board of the Association to meet the manifest need for professional refresher courses as requested by these states.

Even under the strict limitations of the orders of the ODT it was possible to hold 9 very successful meetings. The circuit began May 16 in Chicago, and was followed by a meeting in Springfield, Ill., both under the auspices of the Illinois Public Health Association. Two meetings under the auspices of the Missouri Public Health Association were held in St. Louis and in Kansas City, and two under the auspices of the Kansas Public Health Association in Topeka and Wichita.

The team of speakers, supplementing those from the states concerned, included at these first six meetings James G. Townsend, M.D., Director of the Industrial Hygiene Division, National Institute of Health, Bethesda, Md.; George M. Wheatley, M.D., Assistant Vice President, Welfare, Metropolitan Life Insurance Company, New York; Frank Stafford, M.A., of the U. S. Office of Education, Washington, D. C.; Ruth Fisher, R.N., Associate Director, National Organization for Public

Health Nursing, New York; and Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.

The meetings organized in Denver, Salt Lake City and Boise, Ida., under the auspices of the respective state public health associations, were longer sessions, one in each state. These were attended by Dr. Townsend, Dr. Wheatley and Dr. Atwater and, in addition, by Karl F. Meyer, M.D., the Director of the Hooper Foundation, University of California, San Francisco, who is President of the Western Branch, A.P.H.A.; and by Fred T. Foard, M.D., District Director, U. S. Public Health Service, Denver; and Ruth Freeman, R.N., Director of the Course in Public Health Nursing, University of Minnesota, Minneapolis. Other speakers, including Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service, attended some of these meetings, together with other representatives of the federal services, among them Edith P. Sappington, M.D., Regional Director of the U. S. Children's Bureau, San Francisco.

In spite of the limitation on travel from a distance, it was possible by arranging these meetings according to this schedule to bring the programs before an audience totaling more than 2,100 persons. The opinion was repeatedly expressed by officers of the state public health associations that this method had values in it for the future, since a very large proportion of those who were able to attend these refresher courses would be unable, even in peacetime, to get to a single large meeting either of the Western Branch or of the Association itself. It was the opinion, however, of various state associations affiliated under the Western Branch that

the Branch organization itself should continue and that Branch meetings should be held again as soon as possible after the war. Appreciation was ex-

pressed to the officers of the Western Branch who have made a financial contribution in order to finance the travel of some of the speakers.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers*

- Gastao Cesar de Andrade, M.D., M.P.H.,  
Caixa Postal 1530, Rio de Janeiro, Brazil,  
S. A., formerly Asst. to Director, Serviço  
Especial de Saude Publica
- H. V. Gibson, M.D., Civil Center, Great  
Falls, Mont., Director, Cascade County  
Health Unit
- Max R. Kiesselbach, M.D., M.P.H., 638  
Phelan Bldg., 760 Market St., San Fran-  
cisco 2, Calif., Asst. to the Chief, Bureau  
of Venereal Diseases, State Dept. of Public  
Health
- Ernest S. Kinsey, M.D., M.P.H., 709 Press  
Bldg., Binghamton, N. Y., Asst. District  
State Health Officer, State Dept. of Health
- Michel E. Royere, M.D., American Sanitary  
Mission, Port-au-Prince, Haiti, W. I.,  
Physician
- Frank A. Witt, 346 State St., Hackensack,  
N. J., Health Officer
- James T. Worrell, M.D., 17 W. 4th St., La  
Junta, Colo., Asst. Surgeon (R), U. S.  
Public Health Service; Director, Otero  
County Health Dept.

### *Laboratory Section*

- Capt. Edward Gallardo, M.C., Station Hos-  
pital, Camp Croft, S. C., Medical Inspector
- Harry I. Gilman, Huntsville Arsenal, c/o Eng.  
Serv., Alabama, Toxicologist
- Walter H. Oglesby, P. O. Box 1121, Clovis,  
N. M., Chief Medical Technician, Oglesby's  
Clinical Laboratory
- Otto Rahn, Ph.D., Dairy Bldg., Cornell Univ.,  
Ithaca, N. Y., Prof. of Bacteriology

### *Engineering Section*

- Lester E. Blaschke, U. S. P. H. S. Dist No. 1,  
15 Pine St., New York, N. Y., Asst. Sanitary  
Engineer (R), U. S. Public Health Service
- Lt. William Hendrix, 1004 City Hall, Hous-  
ton 2, Tex., Asst. Sanitarian (R), U. S.  
Public Health Service; Supervisor of General  
Sanitation in Houston
- Lance H. Hoop, P. O. Box 6884, Stockyards  
Station, Denver 16, Colo., President, Western  
Filter Co.

- Major Leonard H. Male, 707 Pere Marquette  
Bldg., New Orleans, La., Sanitary Engineer  
(R), U. S. Public Health Service
- T/S Charles H. Niggeman, Laboratory Tech-  
nician, General Hospital
- Professor Donald E. Stearns, College of  
Applied Science, Syracuse Univ., Syracuse  
10, N. Y., Prof. of Civil Engineering and  
Chairman, Dept. of Civil Engineering
- Roy J. Wasmund, Weld County Health Dept.,  
Greeley, Colo., Sanitarian

### *Food and Nutrition Section*

- Amanda C. Tucker, M.A., 519 Dexter Ave.,  
Montgomery 4, Ala., Senior Nutritionist,  
State Board of Health

### *Public Health Education Section*

- Miriam M. Campbell, State Bureau of Health,  
Augusta, Me., Director of Public Health  
Education
- Ruth E. Christiansen, R.N., Franklin County  
Tuberculosis Hospital, Columbus 7, O., Act-  
ing Director of Nursing Service
- Irene Ann Fahey, M.P.H., 1425 Fargo Ave.,  
Chicago 26, Ill., Health Education Repre-  
sentative, State Dept. of Health
- Alice H. Sanders, M.A., R.N., 90 W. Central,  
Delaware, O., Health Educator, Metropolitan  
Health Council, Columbus, O.
- Jay E. Thompson, 303 Superior St., Toledo 4,  
O., Exec. Secy., Toledo Public Health Assn.
- Dr. Alamiro Valdes-Herrera, Casilla 111,  
La Serena, Coquimbo, Chile, S. A., Jefe,  
Sanitario Provincial, Servicio Nacional de  
Salubridad

### *Public Health Nursing Section*

- Minnie B. Engelberg, R.N., 14 Sunnyside Ave.,  
Charleston, S. C., Staff Nurse, Charleston  
County Health Dept.
- Esther Kaufman, City Health Dept., Sioux  
Falls, S. D., Public Health Nurse, U. S.  
Public Health Service
- Una E. Robertson, R.N., Napoleonville, La.,  
Regional Advisory Nurse, State Dept. of  
Health
- Mary L. Stockbrand, 1209 W. 22½ St., Austin,

Tex., Tuberculosis Nursing Consultant, State Dept. of Health

#### *Epidemiology Section*

Arthur E. Dreuth, 309 "C" St., Marysville, Calif., Venereal Disease Investigator, Bureau of Venereal Diseases, State Dept. of Public Health

Rodolfo A. Gavidia, M.D., Libertad 735, Magdalena del Mar, Lima, Peru, S. A., Consultant in the Inter-American Health Service  
Norman Kramer, Director of Laboratory, Epidemiology Unit

Arnold B. Kurlander, M.D., State Dept. of Health, Phoenix, Ariz., Director, Div. of Tuberculosis Control; P. A. Surgeon, U. S. Public Health Service

#### *School Health Section*

Verne S. Landreth, A.M., 311 California State Bldg., Los Angeles 12, Calif., Chief, Division of Physical and Health Education, State Dept. of Education

Jose de la Fuente Riveroll, M.D., Obregon No. 90, Hermosillo, Sonora, Mexico, School Doctor, State Educational Board

John H. Shaw, Ed.D., Dept. of Athletics and Physical Education, Syracuse Univ., Syracuse, N. Y., In charge of Teacher Training, Division of Teacher Education

Henry W. Vollmer, M.D., 1531 E. Wilson Ave., Glendale 6, Calif., Dept. of Health Education, Pacific Union Conference of the Seventh Day Adventists

#### *Unaffiliated*

John P. Berger, M.D., 509 Brown Bldg., Wichita 2, Kan., Syphilologist

Harold B. Gursha, 218 Foster St., Brighton, Mass., Veterinary Student, Middlesex Univ.

I. D. Richardson, Evadale, Tex., Sanitation Officer, U. S. Navy

Anthony J. J. Rourke, M.D., 2235 Laguna St., San Francisco 15, Calif., Assoc. Prof. of Hospital Administration, and Medical Director, Stanford Univ., Medical School

## APPLICANTS FOR FELLOWSHIP

*In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place during the next two months.*

#### *Health Officers Section*

George H. Becker, M.D., Director, Bureau of Communicable Diseases, San Francisco Department of Public Health, San Francisco, Calif.

Millard B. Bethel, M.D., M.P.H., Health Officer, Cabarrus County Health Department, Concord, N. C.

Philip E. Blackerby, M.D., State Health Commissioner, Louisville, Ky.

George F. Campana, M.D., M.P.H., State Health Officer, Bismarck, N. D.

F. R. Nicholas Carter, M.D., Health Officer and Secretary, Board of Health, South Bend, Ind.

Albert C. Edwards, M.D., M.P.H., Director, St. Clair County Health Dept., Port Huron, Mich.

Floyd M. Feldman, M.D., Dr.P.H., Health Officer, Rochester City Health Dept., Rochester, Minn.

Henry A. Holle, M.D., Surgeon, U. S. Public Health Service, Washington, D. C. (on UNRRA assignment abroad)

Roscoe P. Kandle, M.D., M.P.H., Director, Division of Local Health Service, State Board of Health, New Orleans, La.

Jacob H. Landes, M.D., M.P.H., Senior Health Officer, Department of Health, New York, N. Y.

Frederick D. Mott, M.D., C.M., Chief Medical Officer, Farm Security Administration, Washington, D. C.

Frederick A. Musacchio, M.D., M.S.P.H., Director, Laredo-Webb County Health Unit, Laredo, Tex.

Emil A. Palmquist, M.D., M.P.H., City Health Commissioner, Seattle, Wash.

Angelo M. Perri, M.D., M.P.H., Chief of Communicable Disease Division, Department of Public Health, Philadelphia, Pa.

William A. Powell, M.D., Contra Costa County Health Officer, Martinez, Calif.

C. L. Putnam, M.D., M.S.P.H., Deputy Commissioner and Director of Local Health Services, State Department of Health, Des Moines, Iowa

Arthur L. Ringle, M.D., C.P.H., Director, State Department of Health, Seattle, Wash.

Mason Romaine, M.D., M.P.H., Health Officer, Petersburg, Va.

Roy M. Seideman, M.D., Dr.P.H., Industrial Hygiene Physician, State Department of Health, Hartford, Conn.

Ellis D. Sox, M.D., C.P.H., Chief, Division

of Local Health Service, State Department of Public Health, San Francisco, Calif.

Major General Morrison C. Stayer, M.C., Chief Surgeon, North African-Mediterranean Theater of Operations, U. S. Army (overseas address).

James L. Troupin, M.D., M.S.P.H., District Health Officer, Health Department, New York, N. Y.

I. Oscar Weissman, M.D., M.P.H., Surgeon (R), U. S. Public Health Service; Director, Muskogee City-County Health Dept., Muskogee, Okla.

Maurice S. Whiteside, M.D., Health Officer, Cullman County Health Dept., Cullman, Ala.

John M. Whitney, M.D., Superintendent of Health, New Orleans, La.

Charles L. Wilbar, Jr., M.D., President, Territorial Board of Health, Honolulu, T. H.

Ralph C. Williams, M.D., Assistant Surgeon General and Chief, Bureau of Medical Services, U. S. Public Health Service, Washington, D. C.

#### *Laboratory Section*

Claude S. Bryan, D.V.M., Ph.D., Professor and Head, Department of Surgery and Medicine, Michigan State College, East Lansing, Mich.

Irma L. Comstock, B.S., Principal Biologist, State Board of Health Laboratory, Jefferson City, Mo.

Harald N. Johnson, M.D., Member of Staff and Director of Rabies Study, International Health Division, Rockefeller Foundation, Montgomery, Ala.

Einar Leifson, Ph.D., Professor of Bacteriology, University of South Dakota, Vermillion, S. D.

Benjamin S. Levine, Ph.D., Director, Division of Laboratories, State Board of Health, Pierre, S. D.

Robert P. Myers, Ph.D., Chief Bacteriologist, Research Laboratory, National Dairy Products Corp., Baltimore, Md.

Wade W. Oliver, M.D., Professor of Bacteriology, Long Island College of Medicine, Brooklyn, N. Y.

Clarence C. Ruchhoft, B.S. in Ch.E., Principal Chemist, U. S. Public Health Service, Cincinnati, Ohio

Roy Schneider, Ph.D., Bacteriologist in Charge, Bacteriological Section, Industrial Hygiene Research Laboratory, National Institute of Health, Bethesda, Md.

Lt. Comdr. Frank H. Stubbs, USN, Executive Officer, Duke University N.R.O.T.C., (formerly Director, Branch Laboratory, Georgia State Health Dept.), Albany, Ga.

A. Elizabeth Verder, Ph.D., Bacteriologist, National Institute of Health, Bethesda, Md.

#### *Vital Statistics Section*

Marta Fraenkel, M.D., Medical Advisor, Bureau of Research and Statistics, Social Security Board, Washington, D. C.

Marjorie E. Gooch, Sc.D., Chief, Health Statistics Section, Division of Statistical Research, Children's Bureau, Washington, D. C.

Iwao M. Moriyama, Ph.D., C.P.H., Senior Social Science Analyst, Bureau of the Census, Washington, D. C.

Marcelino Pascua-Martinez, M.D., Associate Professor, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

Elliott H. Pennell, B.S., Senior Statistician, U. S. Public Health Service, Bethesda, Md.

#### *Engineering Section*

Col. William A. Hardenbergh, Sn.C., Director, Sanitary Engineering Division, Surgeon General's Office, U. S. Army, Washington, D. C.

Arthur H. Herberger, C.E., M.S., Director, Division of Sanitation, Nassau County Department of Health, Mineola, N. Y.

#### *Industrial Hygiene Section*

August Baier, M.D., Medical Director, Des Moines Ordnance Plant, U. S. Rubber Co., Des Moines, Iowa

Edgar C. Barnes, B.S., Industrial Hygiene Engineer, Westinghouse Electric Corporation, East Pittsburgh, Pa.

Rodney R. Beard, M.D., M.P.H., Assistant Professor of Public Health and Preventive Medicine, Stanford Medical School, San Francisco, Calif.

Harold T. Castberg, M.D., Chief, Bureau of Adult Health, State Department of Public Health, Berkeley, Calif.

Walter E. Doyle, M.D., Chief, Medical Unit, Industrial Hygiene Division, U. S. Public Health Service, Washington, D. C.

John W. Dugger, M.D., Director, Division of Industrial Hygiene and Factory Inspection, State Board of Health, Jackson, Miss.

Anna M. Fillmore, R.N., M.P.H., Industrial Nursing Consultant, Visiting Nurse Service of New York, New York, N. Y.

Donald O. Hamblin, M.D., Medical Director, American Cyanamid Co., New York, N. Y.

Clifford Kuh, M.D., Dr.P.H., Director of Public Health, Permanente Foundation Hospital, Oakland, Calif.

Hedwig S. Kuhn, M.D., Ophthalmologist; Member, Industrial Vision Institute, Purdue University; Secretary, Joint Committee of



## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

### POSITIONS AVAILABLE

(Supplemental to lists in recent Journals)

**Wanted:** Two engineers for Industrial Hygiene Service of Tennessee. Four different starting salaries between \$2,364 and \$3,900 depending on training and experience. Car furnished. Positions permanent. Opportunity for advancement. Apply Dr. R. H. Hutchinson, Commissioner of Health, Nashville 3, Tenn.

**Wanted:** Physician, Division of Child Hygiene, Ohio Dept. of Health. Salary \$4,200. Must be graduate of approved medical school, have 1 year's internship and at least 1 year graduate training, plus 1 year of training or experience in clinical pediatrics or obstetrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Dept. of Health, State Departments Bldg., Columbus 15, Ohio.

**Positions open:** District and County Health Officers in Florida. Medical degree required. Write or wire Merit System Supervisor, State Board of Health, Gainesville, Fla., for complete information.

**Physician wanted:** Public health pediatrics and epidemiology in large California County Health Department. Major duties consist of infant and pre-school health conferences, school examinations, and epidemiology. Beginning salary \$455 per month, plus travel allowance, and one meal a day. California license required. Training, experience in pediatrics or public health desirable. Immediately available. Apply William C. Buss, M.D., Kern Co. Health Dept., Bakersfield, Calif.

Bureau of Tuberculosis, Board of Health, Territory of Hawaii, seeks Biometrician or Statistician. Position will probably be classified under Territorial Civil Service as CAF-8 with salary of \$244.59 plus wartime bonus of \$50 and yearly increment of about \$192 up to

5 years. Bureau of Tuberculosis is also looking for young physician experienced in tuberculosis work to have immediate charge of active case finding survey program now under way. This position classified under Territorial Civil Service as P-5 with salary of \$416.67 plus \$50 wartime bonus and yearly increment of about \$250 up to 5 years. Apply Robert H. Marks, M.D., Director, Bureau of Tuberculosis, Territorial Board of Health, Honolulu, T.H.

**Wanted:** Bacteriologist with B.S. or M.S. degree, preferably male, to teach student nurses, 45 hour course twice a year, to assist with teaching of second year medical students and do general laboratory work. Salary \$2,000 with option of complete maintenance for \$25 per month. Apply Dr. R. J. Schenken, Director, Dept. of Pathology and Bacteriology, Louisiana State University School of Medicine, New Orleans 13, La.

**Wanted:** Physician to assume directorship, Bureau of Venereal Diseases, in eastern city of 185,000 population. Permanent position. Minimum salary \$4,657, maximum \$5,197.37, includes cost of living adjustment. Travel allowance. Apply Box J, Employment Service, A.P.H.A.

**Maternal and Child Health Services** director for city health department in California, city of 100,000 population. Pediatrician or public health trained physician to administer program, serve as clinician in child health conferences and supervise nursery school health program. Salary up to \$6,300 per annum, plus travel. Send complete details and photograph to Box I, Employment Service, A.P.H.A.

Excellent opportunities, permanent tenure, for doctors, dentists, nurses, technicians with the Oregon State Board of Health in specialized fields. For information write Merit System Council, 616 Mead Bldg., Portland 4, Ore.

**Wanted:** Immediately: Veterinarian for Columbia County Department of Health. Salary—maximum \$3,600 per year plus automobile and up-keep. Veterinarian must be licensed in New York State. Address Dr. Sue H. Thompson, 612 Warren Street, Hudson, N. Y. Position for the duration of the war.

**Wanted:** Sanitarian and dairy inspector for field work. Salary \$2,400 per year plus \$5 per day for living expenses. Auto with gasoline and all other expenses furnished. Apply E. J. Ward, Commissioner of Agriculture, State Dept. of Agriculture, Cheyenne, Wyo.

**Wanted:** Public health officer in well established health department in county of 68,000 population. Salary \$5,500. Apply Floyd O. Prunty, Chairman, Marion Co. Lay Health Committee, 300 Second St., Fairmont, W. Va.

**Executive Secretary Wanted.** Applicant must have some specialized training and experience in health education. Executive experience desirable. Salary \$3,000 up, depending upon qualifications. Car furnished. Apply with full information to A. C. Martin, M.D., Nassau Co. Cancer Committee, 1551 Franklin Ave., Mineola, N. Y.

**Wanted:** Experienced graduate bacteriologist. Take complete charge of local health department laboratory. Civil service protection, tenure and pension. Starting salary \$1,980 per annum. Apply Health Department, P. O. Box 786, Plainfield, N. J.

**Wanted:** Experienced sanitarian for state dairy and restaurant inspection. Salary \$2,400 a year, plus \$5 per day expenses. Car furnished with gasoline and other expenses paid. Apply Dr. G. M. Anderson, State Board of Health, Capitol Building, Cheyenne, Wyo.

City of Jackson, Mich., Civil Service Board will accept immediate applications for position of public health nurse in city health department. Must be graduate of high school and school of nursing of recognized standing with special training in public health nursing; registration in Michigan; some experience in public health nursing, preferably with certificate in public health nursing and some knowledge of advanced public health and social service practice. Salary \$2,000 per year. Applications may be obtained from Civil Service Board, 4th Floor, City Hall, Jackson, Mich.

**Wanted:** Public Health Nurses, Knoxville Area. Generalized nursing service in new and growing health department

with unusual opportunities. Starting salary \$2,500 per year or higher, depending on qualifications. Opportunity for advancement. Apply Health Officer, Oak Ridge Dept. of Health, P. O. Box 486, Oak Ridge, Tenn.

Two positions open in Sanitation Section, Div. of Health, City of St. Louis: Public Health Engineer II, salary \$210 to \$285 per month. Work consists of making surveys and studies of industrial plants, to determine nature and magnitude of industrial hygiene problems; making quantitative studies of plant environment, etc., checking protective equipment for effectiveness and make recommendations for further control measures. Study of ventilation, illumination, and sanitation of workroom. Desirable qualifications include graduation from recognized school of engineering and some experience or graduate training in industrial hygiene or public health engineering. Public Health Engineer I, salary range \$170 to \$220 per month. Engineering investigation of environmental problems and conditions, etc. Desirable qualifications include graduation from recognized school of engineering. No experience necessary. Applications may be made to Personnel Dept., Room 235, Municipal Courts Bldg., St. Louis 3, Mo.

**Wanted:** Bacteriologist, preferably with experience in preparation of antigens, with knowledge of animal immunization and some research experience. Excellent opportunities for advancement. Location, East. Write, giving age, education, experience and salary requirements. Box F, Employment Service, A.P.H.A.

The following positions are available in Michigan:

Hospital Physician, III,	\$287 to \$356
Hospital Physician, IV,	\$373 to \$442
Hospital Physician, V,	\$460 to \$575
Sanatorium Physician, V,	\$460 to \$575
Psychiatrist Va,	\$506 to \$616

Director of a Children's Center  
Physician IV, \$340 to \$420

Head of Medical Department,  
Michigan State Reformatory  
Pathologist V, \$460 to \$575

Tuberculosis Sanatorium

Medical Coordinator V, \$440 to \$550

Assistant in Crippled Children Commission

Apply to Michigan State Civil Service Commission, 220 No. Grand Avenue, Lansing, Mich.

Position of Medical Director, Crippled Children's Program, Arkansas, open. Salary \$4,600, travel expense extra and actual expense of lodging up to \$2.05 a day for meals and 5¢ a mile for travel. Minimum qualifications are 2 years

pediatric residency, 1 year general rotating internship or pediatric internship, 1 year experience in public health or practice of pediatrics or general practice, the greater per cent of which is pediatrics. Salary of \$4,800 to start for applicant with higher qualifications. Prefer someone familiar with Arkansas if possible. Write Commissioner, Dept. Public Welfare, Little Rock, Ark.

**Wanted:** Physician for position of Chief, Bureau of Tuberculosis in California State Dept. of Public Health. Major duties consist of general administration, through local health units, of state and federal tuberculosis financial allotments and subsidies to institutions and of state tuberculosis program. California license required. Special training and experience in tuberculosis and public

health desirable. Monthly salary, \$460 to \$540 plus \$20 emergency adjustment. Apply California State Personnel Board, 1015 L St., Sacramento, for copy of bulletin and application.

**Wanted:** Chief, Bureau of Records and Statistics, California State Dept. of Public Health. Duties consist of administration and supervision of statistical program of the department including registration of births, deaths, and marriages, morbidity statistics, service records, vital statistics and central tabulating unit. Certain administrative public health experience required. Monthly salary, \$360 to \$440 plus \$35 emergency adjustment. Apply to California State Personnel Board, 1015 L St., Sacramento, for copy of bulletin and application.

#### POSITIONS WANTED

Physician, experienced in infectious diseases and communicable disease control, wishes position preferably as teacher. Will consider epidemiology or communicable disease control in health department. A-515

Industrial Hygienist, age 33, B.S. in Ch.E. Graduate training Harvard School of Public Health. Two years insurance engineering, 9½ years full charge industrial hygiene, heavy industry, patents, publications; now directing industrial research; desires responsible position in private industry. IH-460

Health educator, Ph.D. Michigan, experienced in health, physical education, and teaching. Excellent references. H-516

Health educator, Ph.D., Harvard, with training in medical science, public health and education, experienced as teacher, seeks position in Northeastern United States. H-512

Health educator, Master of Science in Public Health Education, with experience in visual aids, would like position with private agency in Southwest or Central West. H-514

[END OF A.P.H.A. LISTING]

#### REGULAR CORPS APPOINTMENTS FOR MEDICAL OFFICERS IN THE U. S. PUBLIC HEALTH SERVICE

A competitive examination for appointment in the Regular Corps in grades of Assistant Surgeon (1st Lieutenant) and Senior Assistant Surgeon (Captain) will be held on the dates listed below.

Regular Corps appointments are permanent in nature and provide unique opportunities to qualified doctors for a life career in one or more of a large number of fields including research, general hospitals, special hospitals, foreign duty, and federal, state, and local public health programs. Assignments are made with all possible consideration of the officer's demonstrated abilities and experiences. There is ample opportunity for professional growth and development. Examinations will be oral and written.

The oral examination will be held at 9:00 A.M. at the several places listed below on the dates shown. The written examination will be held on October 8, 9, and 10 at places convenient to the candidate and the Service.

Applicants for the grade of Assistant Surgeon must be citizens of the United States, must present diploma of graduation from recognized medical school, must have had or be in process of completing an internship or its equivalent, and must have a physical examination at place of oral examination by medical officers of the Service.

Applicants for the grade of Senior Assistant Surgeon must meet the above requirements and must have had an addi-

tional four years of training or experience.

Application forms may be obtained by writing to the Surgeon General, U. S. Public Health Service, Bethesda Station, Washington 14, D. C.

Entrance pay for Assistant Surgeon with dependents is \$3,411 a year and for Senior Assistant Surgeon with dependents is \$3,991 a year. Promotions are at regular intervals up to and including the grade of Medical Director which corresponds to full Colonel at \$7,951 a year. Retirement pay at 64 is \$4,500 a year. Full medical care including disability retirement at three-fourth's pay is provided. All expenses of official travel are paid by the Government. Thirty days' annual leave with pay is provided. All commissioned officers have full military status for the duration of the present war.

Places and dates of oral examinations:

Atlanta, Georgia—Malaria Control in War Areas, 605 Volunteer Building .....Sept. 13  
 Baltimore, Maryland—Marine Hospital, Wyman Park Drive & 31st Street.....Oct. 1  
 Boston, Massachusetts—Marine Hospital, 77 Warren Street (Brighton) .....Sept. 10  
 Chicago, Illinois—Marine Hospital, 4141 Clarendon Avenue..Sept. 25

Cleveland, Ohio—Marine Hospital, Fairhill Road & E. 124th Street .....Sept. 27  
 Detroit, Michigan—Marine Hospital, Vindmill Pointe.....Sept. 26  
 Fort Worth, Texas—U. S. Public Health Service Hospital.....Sept. 15  
 Kansas City, Missouri—USPHS District No. 7, 603 B.N.A. Building .....Sept. 22  
 Kirkwood, Missouri—near St. Louis—Marine Hospital, 525 Couch Avenue .....Sept. 24  
 Los Angeles, California—USPHS Relief Station, 406 Federal Building .....Sept. 17  
 New Orleans, Louisiana—Marine Hospital, 210 State Street...Sept. 14  
 New York, New York—Stapleton, Staten Island—Marine Hospital .....Sept. 11  
 Norfolk, Virginia—Marine Hospital, Hampton Boulevard-Larchmont .....Sept. 12  
 San Francisco, California—Marine Hospital, 14th Avenue & Park Boulevard .....Sept. 18  
 Seattle, Washington—Marine Hospital, Judkins Street & 14th Avenue, South .....Sept. 20  
 Washington, D. C.—USPHS Dispensary, Fourth and D Streets, S.W. ....Oct. 2

## Opportunities Available

### Advertisement

**WANTED**—(a) Clinic physician; duties consist of attendance at maternity center, well baby clinics, skin clinics, physical examinations of school children, and epidemiological investigations; college town of 100,000 not far from Chicago. (b) Pediatrician to serve as assistant director of health department, school system of fashionable winter resort town; part- or full-time; California. (c) Director of student health department, co-educational college having progressive program; enrollment of 4,000 students; 15 bed infirmary, staff of eight nurses; town of 16,000; Southwest. (d) Director, county health unit now being opened; county population, 80,000; headquarters in county seat (30,000); Midwest; \$6,500. (e) Young woman physician; young women's college having enrollment of 300; duties relatively light, including teaching of Hygiene; South. (f) Director of tuberculosis control, division of county health department; should be trained in public health with experience in tuberculosis control or experienced in tuberculosis work with interest in public health medicine; new and rapidly expanding tuberculosis program; South. (g) Assistant university physician; duties consist of caring for ill students and attendance at the daily sick call; approximately 1,200 students; appointments will prove particularly interesting to partially disabled veteran seeking mild climate; \$450, complete maintenance; Gulf Coast. **PHO-1**, The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Public health nursing consultants for following divisions: generalized, orthopedic, maternal and child health, tuberculosis and rheumatic fever; \$2,400-\$3,000 plus travel expenses; Rocky Mountain area. (b) Public health or visiting nurse to direct out-patient department, large hospital located in vicinity of New York City; \$2,400. (c) Public health nurse qualified in orthopedic nursing to give consultant and advisory service in orthopedic nursing to general public health personnel, duties include planning service in specific area; crippled children's commission; Middle West. (d) Director of public health program; must be qualified to supervise generalized public health nursing program; new division of public health education now being established; city-county health department; Southwest. (e) Two public health nursing directors, several public health supervisors, two field representatives, and five staff nurses to become associated with California unit of national organization; permanent; salaries, ranks, dependent upon qualifications. (f) Several public health nurses, preferably with knowledge of Spanish or Portuguese; South and Central America; must be young enough to withstand rigors of living and working in Latin America. **PHO-2**, The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—Community health educator and, also health educator in industry; both positions require

men who are adaptable, friendly, and qualified in public relations and public speaking; must be able to stimulate interest in health among various groups; varied program; eastern university medical center; salaries start at \$3,600. (b) Senior statistician; duties consist of supervising, inaugurating and directing statistical research; public health program; Master's degree in statistics desirable; Middle West. (c) Health educator for important position with tuberculosis organization; Pacific Coast. (d) Several sanitary engineers; new project; Middle West. (e) Health educator; municipal tuberculosis association; New England. **PII8-3**, The Medical Bureau, Burneice Larson, -Director, Palmolive Building Chicago 11.

**WANTED**—(a) Bacteriologist well qualified in medical parasitology; municipal laboratories established to utilize recently developed laboratory diagnostic procedures in connection with virus diseases; Middle West. (b) Bacteriologist-immunologist for important position in development laboratories of pharmaceutical company; experience in preparation of antigens and animal immunization required; East. (c) Bacteriologist; county public health laboratories; resort town, New York; \$200. (d) Chemist to direct laboratories of maternity health department; duties include working with departments of obstetrics and pediatrics, university medical school; Middle West. **PII8-4**, The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

## Situations Wanted

### *Advertisement*

Young physician well qualified as health educator; B.S., M.D., and master of health degrees; several years, director of university health service where he has carried a rather heavy teaching load; recommended as an exceptionally fine teacher, clear thinker about problems of education and student welfare, able to stimulate students to high degree of activity; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Young dentist, graduate of Western Reserve University School of Dentistry; several years' successful private practice; interested in teaching and public health dentistry; for further information, please

write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health educator; A.B. degree eastern school; graduate training in public health; in charge department of public health education in municipal health department, eight years; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Bacteriologist; A.B., M.A., Ph.D. degrees; several years' successful teaching and research experience in general, dairy and food bacteriology; past several years, director, bacteriological department, metropolitan department of public health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### NEW YORK CITY PLANS LARGE POST-WAR EXPANSION IN HEALTH FACILITIES

Mayor LaGuardia recently announced that on behalf of the City of New York he had signed a contract with Columbia University and the Presbyterian Hospital for the construction of a tropical disease hospital, a health research institute, and a hospital research institute to be operated by the City on land ceded by the Columbia Presbyterian Medical Center. Subsequently it was announced that preliminary funds had been made available by the Bureau of Community Facilities, Federal Works Administration, for the preparation of plans for a \$2,200,000 hospital for tropical and communicable diseases. The need for the hospital was said to arise from the increase in international airplane travel and from the impact of returning service men and women, especially those from the tropics. The hospital will have a capacity of 300 patients and it is to be built on a tract facing the Hudson River between 165th and 168th Streets. On the same tract, a short distance north of the hospital it was announced that the City proposed to build a public health laboratory for research and training purposes that would cost \$2,690,000. The announcement states that because New York is an important world port and because medical science has a great deal to learn about tropical diseases and related problems, the city had decided to embark on this twofold project of erecting the hospital, adjacent laboratory and research and teaching center.

### BRITISH SOCIETY OF MEDICAL OFFICERS OF HEALTH HOLDS ANNUAL MEETING

The County Borough Group of the

Society of Medical Officers of Health held their annual meeting July 13-15 at Wadham College, Oxford, under the presidency of Dr. Arthur Massey. Among the members present were Sir Wilson Jameson and Dr. J. A. Charles of the Ministry of Health. The guests at the inaugural dinner held in Hall at Wadham were the Mayor of Oxford, Sir E. Farquhar Buzzard Bt., Professor John A. Ryle and Dr. Robert Sutherland. On July 14, the Mayor gave an official reception for members at the Town Hall. The papers read at the meeting included: The Institute of Social Medicine—Problems and Prospects, by Prof. J. A. Ryle, Health Education, by Dr. R. Sutherland, Post-war Housing, by Dr. J. Greenwood Wilson, and School Medical Services and the New Education Act, by Dr. G. C. Williams. There was a special demonstration by Mr. H. Cotton of the statistical methods and machines in use at the Institute of Social Medicine. The Group elected Dr. R. H. H. Jolly as next year's President. The honorary secretary of the Group is Dr. J. Greenwood Wilson.

### DR. PERKINS TO STUDY HEALTH CONDITIONS IN ITALY

Dr. James E. Perkins, director of the Division of Communicable Diseases, New York State Department of Health, began a leave of absence on June 15 during which he will go to Italy to serve on the Italian Medical Nutrition Mission. The Mission is studying health problems which have developed in that country following the war and is aiding in the establishment of a program for their control.

Dr. Perkins was commissioned as a reserve officer for the purpose by the

U. S. Public Health Service and assigned to the United Nations Relief and Rehabilitation Administration under which the Mission is operating. He will assist the Mission in all aspects of its work within the scope of epidemiology.

One of the major objectives in this field is to learn the extent of malnutrition among the population and to assist UNRRA in raising nutrition levels as quickly as possible. The prevalence of malnutrition will be estimated by means of a series of surveys of representative samples of the population, throughout Italy, the nutritional status to be determined by clinical manifestations and x-rays of long bones. Tied in with these surveys will be an attempt to ascertain the prevalence of active tuberculosis which is known to have increased tremendously. Its presence will be detected through chest photofluorographs.

Another aspect of the study, which comes within the field of nutrition research, will consist of intensive investigation over a considerable period of time of approximately 1,000 persons in one locality. The reciprocal relationship between malnutrition and the development of clinical cases of various communicable diseases will be studied also.

In addition to assisting in these inquiries, Dr. Perkins will aid in the suppression of diphtheria, typhoid fever, and other communicable diseases which have become widespread since the war.

Teams of Italian physicians, nurses and other specialized personnel have been organized to assist in the studies. These local groups will carry on the work after the American members leave.

Dr. Perkins plans to be in Italy for three months as co-epidemiologist of the Mission to continue activities which have been conducted over a similar period by Dr. Ernest L. Stebbins, New York City Health Commissioner, who accompanied the first contingent which left in April and who has returned to this country.

#### MENTAL CLINICS FOR VETERANS

Five clinics for veterans have been established by the Michigan Society of Neurology and Psychiatry at Ann Arbor, Detroit, Flint, Kalamazoo, and Saginaw in coöperation with the Michigan State Hospital Commission and the State Office of Veterans' Affairs. The Detroit clinic began accepting patients for treatment February 6. This clinic, which is financed principally by the war chest of metropolitan Detroit, occupies quarters provided by Harper Hospital and is in operation three evenings each week; eighteen psychiatrists are contributing their services without compensation. Five additional clinics in upper Michigan are being planned by the Michigan Society of Neurology and Psychiatry sometime within the near future.

#### SCHOOL HEALTH SERVICE IN LOCAL COMMUNITIES

"Local Health Units for the Nation," a report of an Association Subcommittee published in August, suggests a minimum program of local health service for approximately one dollar per capita through 1,200 health units that would cover the 3,070 counties of the country and their contained cities.

The basic, perhaps revolutionary, idea of the committee is that present-day conditions demand present-day methods. Whereas there are about 155,000 units of local government, it would consolidate these for local health purposes into 1,197 units with an average population of 110,000 and only 14 per cent with less than 45,000.

Since school districts are 70 per cent of the 155,000 local governmental units and since it is not an unusual practice for school boards to organize school health service apart from the local health department, school districts are the chief source of multiplicity of local health jurisdiction. In New Jersey,

which has 567 municipalities, each with responsibility for local health service, state law requires that school health service be administered by local school boards. In Massachusetts a law in existence since 1906 prohibits any city health department from carrying on the health work of public schools unless it had already done so when the law was passed, but it serves parochial schools. In Pennsylvania school health service is the responsibility of school districts with populations of 5,000 or more; in others it rests with the state health department's local health service program. There are, of course, numerous examples of school health service administered by health departments as in Buffalo, New York City, Rochester, Detroit, Milwaukee, San Francisco, and Worcester, and in the counties of Alabama, Florida, Georgia, and Kentucky.

The committee recommends that, where a well organized local health department exists, it should carry on school health service with close coöperation of both groups, including active teacher participation in the program, particularly in child health, in public health nursing, in health education, and in a public health dental program now very largely lacking. It believes much overlapping of effort can be avoided by a single responsible authority. It believes also that the educational program itself is so important that it should not be burdened with a program for the administration of which another community service has the requisite organization and professional personnel.

#### MEXICO NUTRITION PROJECT RENEWED

According to a recent issue of *Science*, for the third successive year the W. K. Kellogg Foundation has made a grant to the Pan American Sanitary Bureau in support of a nutrition project in Mexico conducted by the Nutritional Biochemistry Laboratories of the Massachusetts Institute of Technology in

collaboration with the Mexican Institute of Nutrition. In previous years, three physicians and two chemists from Mexico were trained in this country; a large number of Mexican foods were analyzed; a federal school lunch program was initiated; the nutritional status of a thousand school children in Mexico City was determined, and the equipment for a modern food analysis laboratory was provided. A part of the present grant of \$10,300 will be used to encourage the further analysis of Mexican foods. Dr. Francisco de P. Miranda is Chief of the Mexican Institute of Nutrition, and Professor Robert S. Harris, of the Massachusetts Institute of Technology, is in charge of the project.

#### TRUDEAU MEDAL AWARDED DR. FLORENCE R. SABIN

The National Tuberculosis Association has announced the award to Dr. Florence R. Sabin of Denver of the Trudeau Medal for meritorious contributions to the cause, treatment, or prevention of tuberculosis. Dr. Sabin is known for her work on the pathology of tuberculosis and on the origin, nature, and activities of the white blood cells. The Medal was established in 1926 in memory of Dr. Edward L. Trudeau, the association's first president.

Dr. Sabin, who is a member of the N.T.A.'s committee on medical research, has long been engaged in studies of the physiologic activities of the chemical fractions of the tubercle bacillus.

#### TRAINING FOR THE SCIENTIFIC PROFESSIONS

"For science in this country—no matter what it has achieved—has been doomed to a season of sterility. And one of the most urgent questions before Congress and the people today is how to shorten that season of sterility. We



haven't come to the season yet. We are headed for it. It will go down in the books for all time and all posterity that in this war the American democracy shoveled its potential scientists into the armed forces, and thus killed off large numbers of them and, what is to the point today, it failed almost altogether to educate a six year supply of scientists. The result is that we shall be short about 150,000 scientific and technical students with bachelors' degrees, and ten years from now we shall be short 17,000 men capable of doing original scientific work in chemistry, engineering, geology, mathematics, physics, and the biological sciences."

Thus—Raymond Ewing in a broadcast of July 19 in support of the plea of Dr. Vannevar Bush, Director of the Office of Scientific Research and Development, to President Truman to establish a government agency which will provide 24,000 undergraduate scholarships and 900 graduate fellowships in science.

Dr. Bush's report and Mr. Swing's broadcast were made coincidentally with an action of the Executive Board which declared the American Public Health Association's support of a joint report of the National Research Council and the American Council on Education dealing with the need for the immediate resumption of training for the scientific professions. Copies of the document may be obtained from Dr. M. H. Trytten, 2101 Constitution Avenue, Washington 25, D. C.

#### AMERICAN ASSOCIATION OF UNIVERSITY WOMEN FELLOWSHIPS

National, international, and undesigned Fellowships, the majority of \$1,500 each, and a special achievement award of \$2,500 are offered by the American Association of University Women for graduate study and research for 1946-1947.

These Fellowships are awarded in general to candidates who have completed two years of residence work for the doctor's degree, or who have already received the degree. The greatest importance is attached to the project on which the candidate wishes to work, its significance, and the evidence of the candidate's ability to pursue it. Applications and supporting materials must reach the office in Washington by December 15, 1945. For detailed information concerning these Fellowships, instructions for applying, and the conditions of acceptance, address the Secretary, Committee on Fellowship Awards, American Association of University Women, 1634 I Street, N.W., Washington 6, D. C.

#### AMERICAN MEDICAL OFFICERS AID IN FIGHT AGAINST CHOLERA

It has been announced by the United Nations Relief and Rehabilitation Administration in Washington that a group of physicians is now enroute to China to assist in fighting a cholera epidemic in Chungking. Among the members of the group are James Watt, M.D., Dr.P.H., of the U. S. Public Health Service staff, E. K. Musson, M.D., M.P.H., USPHS (R) assigned to UNRRA, H. A. Reimann, M.D., Jefferson Medical College, Philadelphia, and W. W. Frye, M.D., Vanderbilt University, Nashville, Tenn.

#### RELEASE OF SANITARY ENGINEERS FROM ARMED SERVICES IS EXPEDITED

The attention of the *Journal* has been called to War Department Circular 485, "Relief of Officers . . . from Active Duty," under which the *Journal* is informed by the Public Health Service some work has been done recently to expedite the release of sanitary engineers. It is desired that health officers should be aware of these provisions.

Paragraphs 7 to 9, inclusive, cover those circumstances when it can be

definitely determined that an officer can render more valuable service to the nation in a civilian capacity. It is provided that the officer himself must initiate the request, which should be forwarded through channels of the respective service.

Persons in the armed services and executives of health departments interested in the return of essential staff members will benefit from a perusal of the *Circular No. 485*.

#### NEW BRITISH MINISTER OF HEALTH

The press has announced the appointment under the new Labor Cabinet of Great Britain, of Aneurin Bevan, 47, as Minister of Health. Mr. Bevan is a former miner who has been an active member of the Labor Party.

#### FULL-TIME VITAL STATISTICS REGISTRARS RECOMMENDED

At a meeting of the State Registration Executives of Region III of the Council on Vital Records and Vital Statistics held on May 9, 1945, in Gatlinburg, Tenn., the following resolution was passed:

WHEREAS, statistics compiled from recorded births and deaths are the basis of all public health programs, and

WHEREAS, the value of such statistics depends upon the completeness and accuracy of such birth and death registration, and

WHEREAS, the completeness and accuracy of birth and death registration are contingent upon the time and effort given the work by the local registrar, and

WHEREAS, this work is of such importance as to require the entire time of a local registrar in a health unit,

THEREFORE, every health unit should have a registrar of vital statistics on a full-time basis, with travel allowance, and to this end we recommend that the Council on Vital Records contact the U. S. Public Health Service, the American Public Health Association, and the State and Territorial Health Officers Association in an effort to develop and to further a plan to incorporate the position of registrar into every full-time health unit.

#### NATIONAL ADVISORY HEALTH COUNCIL OF THE U. S. PUBLIC HEALTH SERVICE

The National Advisory Health Council met at Public Health Service headquarters in Bethesda, Md., on June 19 and 20, 1945.

The two day session was devoted to discussion of the current and future activities of the several Bureaus of the Public Health Service.

Surgeon General Thomas Parran, in opening the meeting, called attention to the legal functions now vested in the National Advisory Health Council under the provisions of the Public Health Service Act of 1944 (P.L. 410). Before the passage of this law, the Council served solely in an advisory capacity. Now the Council has the legal responsibility to:

1. "... advise, consult with, and make recommendations to the Surgeon General on matters relating to health activities and functions of the Service"; and to serve in other capacities as requested;

2. Recommend research projects for grants-in-aid in scientific fields other than cancer research, and recommend other procedures for the advancement of scientific research;

3. Recommend the adoption of regulations by the Service with respect to interstate quarantine for the prevention of communicable diseases, including regulations for the apprehension, examination, and detention of persons who are spreading disease.

The programs of the Sanitary Engineering Division, the Bureau of Medical Services, and the Bureau of State Services were discussed on the first day. On the second day, a proposed plan for training of Public Health Service personnel was presented by the Division of Public Health Methods; the Nurse Education Division presented proposals for the post-war nursing program; and the work of the National Institute of Health was discussed.

The Council recommended the approval of a grant-in-aid of \$92,000 to the University of Utah for research on muscular dystrophy. This is the first

grant-in-aid for general research projects to be made under the provisions of P.L. 410.

Among other important decisions of the Council were recommendations that:

1. A committee of the Council be appointed to act with designated officers of the Service in the development of a program of clinical research in the Public Health Service;

2. The Public Health Service strengthen its control of the interstate spread of disease through consultant services to public health laboratories and through maintenance of a \$1,000,000 emergency fund to be used in epidemics and disasters;

3. The Public Health Service undertake demonstrations in selected communities of generalized public health nursing programs, including bedside care;

4. The Public Health Service establish a training program for their own personnel, which would include orientation, work experience, observations, in-service training, and opportunities for State and local personnel to participate;

5. The program of grants-in-aid and technical services to the States in the field of industrial hygiene be expanded;

6. The Public Health Service seek appropriations for grants-in-aid for general research to be allotted to qualified institutions and individuals;

7. When the federal government undertakes grant-in-aid programs related to public health and sanitation, the Public Health Service be empowered to conduct investigations for determination of the nature and extent of the problems involved and to approve the allocation of funds, functional effectiveness, and placement of plants, installations, and constructions required of such programs.

In addition, the Council approved the policy of the Public Health Service on national programs for the control of water pollution.

Regular meetings of the Council will be held twice a year; special meetings will be called as needed. Council members are to serve as chairmen of special committees dealing with specific subjects.

The members of the National Advisory Health Council are Alphonse R. Dochez, M.D., Clarence C. Selby, M.D., Kenneth F. Maxy, M.D., Alfred C.

Reed, M.D., John H. Musser, M.D., Henry F. Vaughan, Dr.P.H., Harry S. Mustard, M.D., Gordon M. Fair, Carl S. Marvel, and William C. Rose.

Ex Officio members are Captain T. J. Carter, MC, USN, Asst. Surgeon General R. E. Dyer, Harry W. Schoening, and Brigadier General James S. Simmons, USA.

#### COLUMBIA UNIVERSITY OFFERS COURSE IN HOSPITAL ADMINISTRATION

Columbia University announces that, aided by a grant from the W. K. Kellogg Foundation, it will offer a course in Hospital Administration beginning September 27, 1945. The course will be of approximately 21 months' duration: an academic year in residence, and a calendar year of supervised assistantship in an affiliated hospital. A baccalaureate degree will be a minimum requirement. Women will be admitted on the same terms as men. The course will be offered through the School of Public Health of the Faculty of Medicine of the University.

#### X-RAY SURVEY CENTER PLANNED IN CALIFORNIA

A mass x-ray survey plan, calling for the establishment of a permanent x-ray survey center open to the public five days a week, has been unanimously approved by the Board of Directors of the Sacramento County Tuberculosis and Health Association. The plan will make it possible to offer free x-rays to every family in the city and county in the next two years. An estimated 500 families daily will be sent direct invitations by mail giving them specific appointments for x-ray examination, these to be sent after the mailing of literature explaining the purpose of the county-wide program and a summary of the tuberculosis problem in the area. It is hoped to have the plan in full operation by fall, according to the *Bulletin* of the N.T.A.

# NATIONAL INSTITUTE OF HEALTH RESEARCH FELLOWSHIPS

The U. S. Public Health Service announces the creation of National Institute of Health research fellowships, after July 1, 1945.

The junior research fellowships will be available to those holding master's degrees in the sciences (such as physics, chemistry, entomology, etc.) allied to public health, from an institution of recognized standing. The stipend will be \$2,400 per annum.

The senior research fellowships will be available to those holding a doctor's degree in one of the sciences allied to public health. The stipend will be \$3,000 per annum.

These fellowships will offer an opportunity for study and research at the Institute or some other institution of higher learning, in association with highly trained specialists in the candidate's chosen field.

Letters of inquiry should be addressed to The Director, National Institute of Health, Bethesda 14, Md.

## NEW OFFICERS OF AFFILIATED SOCIETIES

Three affiliated societies of the A.P.H.A. elected the following new officers at recent meetings:

### *Colorado Public Health Association*

*President*—Millard F. Schafer, M.D., Colorado Springs  
*Vice-President*—Mary H. Emberton, R.N., Denver  
*Treasurer*—Frances Hedges, Pueblo  
*Secretary*—Eleanor Lee Hearon, Denver

### *Idaho Public Health Association*

*President*—E. L. Berry, M.D., Orofino  
*1st Vice-President*—Stuart Robinson, D.D.S., Gooding  
*2nd Vice-President*—Mrs. H. J. Maughn, Preston  
*3rd Vice-President*—George C. Halley, M.D., Twin Falls  
*4th Vice-President*—H. L. Newcomb, M.D., Emmett  
*5th Vice-President*—Mrs. Grant Hess, Boise

*Secretary*—John W. Wright, Boise  
*Treasurer*—Lucy Higgins, Boise

### *Utah Public Health Association*

*President*—Thomas L. Martin, Ph.D., Provo  
*President-elect*—Elmer B. Quist, Salt Lake City  
*Vice-President*—William V. Hickey, Salt Lake City  
*Treasurer*—Helen E. Vance, Salt Lake City  
*Secretary*—E. H. Bramhall, Salt Lake City

## CHICAGO INDUSTRIAL HEALTH COMMITTEE

The Chicago Industrial Health Committee is the name tentatively selected for an organization now being developed for Chicago and Cook County. The project is being formed to provide industrial workers in participating industries with continuous and authentic health information on vital health problems and to promote the utilization of procedures, such as Kahn tests, chest x-rays, and vision testing, to be made available through cooperating health agencies as requested and available. The entire project will be set up as a health education program.

## PERSONALS

### Central States

RICHARD A. BOLT, M.D., DR.P.H.,\* has resigned as Director of the Cleveland Child Health Association, Cleveland, Ohio, to join the staff of the University of California School of Public Health, Berkeley.

EDWARD W. CLINE, M.D.,† of Platte City, Mo., Health Officer of Platte County, has been appointed to a similar position in charge of the newly merged City-County Health Department of Jasper County with offices in Joplin.

MAX L. DUFEE, M.D.,† Health Director at Iowa State Teachers College, Cedar Falls, Ia., since 1939, has resigned to accept a position as

\* Fellow A.P.H.A.

† Member A.P.H.A.

Director of Health Service at the University of Oklahoma, effective July 1.

FRANK L. GUNDERSON, PH.D.,<sup>†</sup> who has served as Executive Secretary of the Food and Nutrition Board of the National Research Council, Washington, has announced that as of October 1 he will become associated with Pillsbury Mills, Inc., in Minneapolis, Minn., and will be concerned with product research and development. He will continue as a consultant to the Food and Nutrition Board.

ROLV S. HEGGE, M.D., of Austin, Minn., has been named Health Officer of Mower County to succeed Dr. JAMES J. MORROW.

CLARA R. JOHNS, M.D.,<sup>†</sup> of Topeka, Kan., was recently appointed Health Officer of Johnson County.

ROLAND F. MUELLER, M.D., of Two Harbors, Minn., has been appointed Health Officer of Lake County.

IRA F. THOMPSON, M.D.,\* has announced his resignation as Commissioner of Health to Racine Wis., effective sometime in October. Dr. Thompson has been serving in the position since 1932, when he succeeded Dr. WILLIAM W. BAUER.\*

#### CHANGES IN HEALTH OFFICERS IN MICHIGAN

VERNE L. VAN DUZEN, M.D., of Belding, Mich., has been appointed Director of Health for the Mecosta-Osceola Health Department, effective June 1.

JAMES J. CROLEY, M.D., of Houghton, has been appointed Director of Health of Kalamazoo County.

#### Eastern States

GEORGE BAEHR, M.D.,\* has been reappointed by Governor Dewey as a member of the New York State Public Health Council to serve a 6 year term dating from January 1, 1945.

FRANCIS G. BLAKE, M.D., Sterling Professor of Medicine and Dean of Yale University School of Medicine, New Haven, received the Charles V. Chapin Memorial Award for 1945 from the City of Providence, R. I., during the 134th annual meeting of the Rhode Island Medical Society. The subject which Dr. Blake chose for his Chapin oration was "Some Recent Advances in the Control of Infectious Diseases."

HAROLD W. BROWN, M.D.,\* Columbia University, College of Physicians and Surgeons, New York City, received the honorary degree of Doctor of Science at the recent commencement of Kalamazoo College, Kalamazoo, Mich.

MAJOR FRANKLIN M. FOOTE, MC, AUS,\* has been made Acting Director of the Department of Military Sanitation, Medical Field Service School, Carlisle Barracks, Pa. He is responsible for teaching military preventive medicine and field sanitation to physicians, dentists, veterinarians, and other officers.

BASIL C. MACLEAN, M.D., M.P.H.,\* Director of the Strong Memorial Hospital, Rochester, N. Y., has been appointed professor of hospital administration in the University of Rochester School of Medicine and Dentistry. Dr. MacLean has been director of the Strong Memorial Hospital since 1935 and recently served with the Medical Corps of the Army as consultant in the Surgeon General's office. Dr. MacLean is also in charge of a ten-member commission appointed by Governor Dewey to draft a program providing medical care for the state's needy and to make recommendations for action by the state legislature.

MARY POWER,<sup>†</sup> who has served as a staff member of the Onondaga Health Association in Syracuse, N. Y., in community health organization has

resigned to become Executive Secretary of the Fort Greene District Health Committee, Brooklyn, N. Y.

### Southern States

GLENN H. BAIRD, M.D.,† has resigned as Health Officer of the Smyth-Washington-Bristol Health District in Virginia, to accept a commission with the U. S. Naval Reserve.

THOMAS K. CHANDLER, JR., M.D.,† of Tunica, Miss., Director of the Tunica County Health Department, has been appointed to a similar position in Coahoma County, succeeding Dr. GUY R. POST,† who has become Medical Director of the Crippled Children's Service and Medical Consultant of Vocational Rehabilitation for the State.

HENRY HOLLE, M.D.,† of Austin, Tex., has been assigned as Medical Officer to the temporary delegation being sent by UNRRA to Warsaw, Poland. Dr. Holle has been associated with the Health Division of UNRRA since 1944. Prior to that time he was Chief Quarantine Officer of the Panama Canal, Balboa Heights.

JOHN McIVER JACKSON, M.D.,† has been appointed Health Officer of the Norfolk-Princess Anne Health District in Virginia, succeeding WILLIAM B. BAILY, M.D.†

RAYMOND D. KIMBROUGH, M.D., of Norfolk, Va., has been appointed Associate Professor of Preventive Medicine and Public Health and Associate Professor of Dermatology and Syphilology at the Medical College of Virginia, Richmond, effective May 1. He will continue his private practice.

COL. MARY G. PHILLIPS, ANC, former Deputy Director of the Nursing Division and Chief of the Nursing Policies Branch, Office of The Sur-

geon General, will depart for the Pacific Ocean Area on her new assignment as Director of Nursing Service. Her Army assignments include service in the Philippines as well as service in this country at various Army hospitals. She was assigned to the Nursing Division in The Surgeon General's Office as Assistant to the Superintendent of the Army Nurse Corps in May, 1943.

LUTHER A. RISER, M.D.,† has resigned as Director of the Department of Vital Statistics of the State Board of Health, Columbia, South Carolina.

THOMAS T. ROSS, M.D.,† of Little Rock, Ark., State Health Officer, was reappointed for a four year term when the State Board of Health met in quarterly session April 19. His new term began July 1, it is reported.

MARTIN H. SKAGGS, M.D., has resigned as Health Officer of Shelby County, Ky., effective June 1, to enter private practice in Taylorsville.

EDWIN BRUCE UNDERWOOD, M.D.,† of Morganfield, Ky., has been appointed Director of the Henderson County Health Department, succeeding EDWIN W. SIGLER, M.D.†

JOHN H. WALKER, M.D., of Atlanta, has been appointed Pediatric Consultant to the Division of Maternal and Child Health of the Georgia Department of Public Health, succeeding Dr. PAUL R. ENSIGN.\*

### Western States

THOMAS J. HOWELLS, M.D.,† on May 18 was named Director of the Salt Lake County Health Department in Utah. Dr. Howells has served as Superintendent of the Salt Lake County General Hospital and also as Health Commissioner of Salt Lake City.

DAVID A. YOUNG, M.D., Assistant Professor of Psychiatry and Neurology at the University of Utah School of Medicine, Salt Lake City, has been

\* Fellow A.P.H.A.

† Member A.P.H.A.

appointed General Superintendent of Mental Health for the four state hospitals of North Carolina, a newly created position. The appointment will be effective September 1. He is to coördinate the work of the four state institutions in order that better medical and mental care may be available.

#### CHANGES IN HEALTH OFFICERS IN WASHINGTON STATE

EMIL E. PALMQUIST, M.D.,† on July 1 was named Commissioner of Health for the City of Seattle. Dr. Palmquist was formerly Health Officer for King County.

R. E. CUTTS, M.D., has been named Head of the Maternal and Child Hygiene and Crippled Children's Section of the State Department of Health.

CEDRIC NORTHROP, M.D.,† is the Head of the newly created Section of Tuberculosis Control.

HOWARD W. LUNDY, DR.P.H.,\* has been appointed Head of the Section of Public Health Education.

All these changes were effective as of July 1.

#### Foreign

DR. C. H. BENNING,\* Surgeon (R), U. S. Public Health Service, is at present Medical Liaison Officer from UNRRA to the High Commission for Italian Refugees. Up until 1941, Dr. Benning was Deputy Commissioner of Health of Oakland County, Mich. Since August, 1941, he has served in Puerto Rico, Texas, Charlottesville, Va., Walter Reed Hospital, Washington, D. C., and Egypt.

BRIG. GEN. HENRY C. DOOLING, M.C., who was on a 30 day mission in the battle areas of the Mediterranean theater, has returned to his activities

as Chief Health Officer of the Panama Canal. While in Italy, General Dooling met MAJOR GEN. MORRISON C. STAYER, M.C.,† who preceded him as Chief Health Officer of the Panama Canal. COL. ALBERT R. DREISBACH, M.C., acted as Chief in General Dooling's absence.

FELIX HURTADO, M.D.,† Havana, Cuba, has been appointed Chairman of Region 5 of the American Academy of Pediatrics, including all Latin American countries. Associated with Dr. Hurtado in this responsibility are DRS. F. GOMEZ of Mexico City and V. ESCARDO of Montevideo.

LUIZ MENDONCA E SILVA, M.D., who was employed in the Office of Health Education in the State Health Department in Rio de Janeiro, is studying currently at the DeLamar Institute of Public Health, Columbia University, New York.

LE COLONEL BRIGADIER VOLLENWEIDER has recently been appointed director of the Office of Public Health in Berne, Switzerland, having retired as chief of the Swiss Army Medical Service.

#### Deaths

SIMON WILLIAM BROWNSTEIN, M.D., who was for eighteen years Chief of Clinics for the City Board of Health in Chicago, died May 7, aged 78.

WILLIAM LITTERER, M.D.,\* of Miami, Fla., died May 1, aged 67. He was formerly Professor of Bacteriology and Assistant Professor of Preventive Medicine and Public Health at Vanderbilt University School of Medicine, Nashville, Tenn., and Director of Laboratories for the Tennessee Department of Public Health for many years.

CHARLES JOHNSON SMITH, M.D., of Portland, Ore., one of the organizers and Past President of the Oregon State Board of Health, died April 19, aged 80.

\* Fellow A.P.H.A.

† Member A.P.H.A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 35

October, 1945

Number 10

## Public Health in the Reconversion Period

THOMAS PARRAN, M.D., F.A.P.H.A.

*Surgeon General, U. S. Public Health Service, Washington, D. C.*

TO foresee at this time all of the nation's peacetime health problems is as difficult as it was, at the outset of the emergency in 1940, to predict all the problems of war. It is well, however, for public health officials in all parts of the country to take stock of the current situation and to plan now for dealing with emergencies during the period of reconversion. In many peacetime health activities, we shall have to "learn by doing"; but we shall learn faster and do better if we can agree upon certain basic assumptions which will shape our thinking and action. It is reasonable to assume, that:

1. Reconversion to a peacetime economy will create health problems comparable in scope and extent with those of war.

2. State and local health authorities will have to take over a larger share of the costs of many essential programs.

3. The federal government will not assume sole responsibility for the planning of public health works; initial efforts must come from the states.

4. The release of man power and materials for construction offers opportunities for the establishment of essential health facilities at an earlier time than could be anticipated two short months ago.

5. The training of health personnel, in suf-

ficient numbers and of adequate qualifications, will require joint action on the part of all official and nonofficial agencies concerned.

6. Health organizations larger than any we have known before, both in size and in scope of operations will be needed to attain the objectives of national health.

### RECONVERSION PROBLEMS

Recent estimates of the Census Bureau show that 27,000,000 Americans, exclusive of military personnel, have migrated during the war—nearly one-fifth of the total population. Many of these will return to home communities where health services and facilities are depleted. Many others will remain in localities where unsatisfactory war conditions have prevailed; demands for adequate health services in such areas will have to be met. Wartime health installations are being liquidated. Add to this the demobilization of some 10,000,000 service men and women within the next twelve months, and the magnitude of the reconversion problem comes into focus.

During the period of adjustment, health problems are certain to be aggravated in all areas. The control of communicable diseases, especially those spread by personal contact, will be more



difficult than during the war, when the military authorities coöperated with the civilian agencies in applying brakes to the spread of venereal infection, tuberculosis, and epidemic diseases among a sizable group of the population.

As a national wartime responsibility, the federal government has supplied the funds and personnel to keep together a public health organization during these critical years. The Emergency Health and Sanitation Appropriations to the Public Health Service (1941 through 1945) have totalled \$38,672,700 for services in military and war industrial areas. These services have included the assignment each year of between 300 and 400 professional personnel to state health authorities, by the Public Health Service.

The activities maintained by this emergency force and the depleted staffs of the state and local agencies have actually held the line against serious threats to national health. Realistically, health officials admit that the lines against disease have been thinly held.

That we have been spared a devastating epidemic during the war has been nothing short of a miracle. If a virulent strain, instead of a mild type of influenza, had struck us in the winters of 1940-1941 and 1943-1944, the loss of life would have been great, for we have no proved scientific controls against the disease. Throughout the war years, meningitis has been at the highest incidences ever reported, although deaths have been lower than in the past, due to the use of sulfa drugs. Poliomyelitis, never a frequent cause of death, has shown an upward trend during the last decade; in 1944 and 1945, it was epidemic in many areas. Scarlet fever, which responds to sulfa therapy, was epidemic in a number of states in the first quarter of 1944. Local outbreaks of diseases such as typhoid fever, other gastrointestinal infections, and small-

pox have occurred; but they have been brought quickly under control because public health organizations were available promptly to apply known methods of prevention. That these outbreaks were so few in number and so negligible in their effects is due to the untiring efforts of the civilian health personnel.

Through greatly expanded wartime services, the civilian health authorities have been able to hold the gains previously made against syphilis. After five war years, when sharp increases in this disease were to be expected, the present estimated annual incidence of 200,000 cases represents a notable achievement. Prior to 1939, mass methods of control had not been applied to gonorrhea; the attack on this disease during wartime has, therefore, had to be directed against abnormal conditions of increased exposure.

There has been no general rise in tuberculosis mortality among civilians during the war, although doubtless there has been an increase in certain areas and population groups. Through the coöperation of industry, the military authorities, and health agencies, nearly 200,000 cases have been brought to light by means of x-ray examinations among civilians and the armed forces. About two-thirds of these cases, when discovered, were in the early stages of the disease.

Undoubtedly, the wartime program has contributed to the control of tuberculosis mortality. However, since facilities for follow-up, treatment, and rehabilitation have not been commensurate with the increased number of cases, it is probable that we owe our wartime control of tuberculosis as much to full employment and better nutrition among vulnerable population groups as to public health efforts. The disease remains a major cause of death and disability in the United States. A peacetime program for its ultimate eradication has been established and

implemented by the federal government. It is indeed fortunate that the Public Health Service and state agencies have been enabled to prepare for more intensive tuberculosis control during the reconversion period. In the next few years, our efforts must be redoubled to prevent serious increases in tuberculosis, as millions of young adults return from the war to take up family life again. Returning from areas abroad, where the disease is epidemic—many of them suffering from ill treatment in prison camps—thousands of veterans may be expected to break down with tuberculosis in the years to come, and to spread the disease in their families, unless the public health program promptly reaches its full development. Case finding should be expanded as rapidly as possible, in order to bring a larger number of tuberculosis patients under treatment.

Among the communicable diseases, tuberculosis, syphilis, and gonorrhea present the greatest difficulties. The potentialities of their increased transmission and entrenchment in new strongholds are great, because public health authorities will have to work uphill against an enormous and unrestricted movement of population, against depleted facilities and services, and against relaxed public concern.

Present indications are that industry will reconvert to the manufacture of consumer goods more speedily than it converted to war production. Health protection in the plants will be forgotten in the haste to put new processes into operation. Millions of workers—including veterans who have been out of such occupations for several years—will be exposed to occupational hazards inherent in the production of new items. During the war, countless new substances have been introduced, notably materials used in the manufacture of plastics, synthetic rubber, airplanes, automotive equipment, and clothing.

These substances will be reconverted to consumer production. It is a task for public health authorities to see that the controls developed by the industrial hygienists during the war shall be reconverted as well as the hazards. The small staffs of the federal, state, and local industrial hygiene services have done a magnificent job during the war. Their hands must be strengthened to protect the health of the workers in the immediate future.

#### STATE AND LOCAL RESPONSIBILITY

A very large share of the public health accomplishment during the war has been made possible under wartime appropriations of the United States Congress. For example, almost the entire burden of industrial hygiene work has been carried by the Emergency Health and Sanitation Appropriation. The entire rapid treatment program for venereal disease control has been financed by special war appropriations. Local health services belatedly developed in many parts of the country have been established as wartime activities. A large part of the environmental sanitation program for the protection of food, milk, and water supplies, sewage and refuse disposal, has been maintained by war appropriations.

State and local health agencies must look forward to taking over a larger part of the cost of all these basic public health services. The needs for them will be no less during the reconversion than in wartime; in fact, needs will be greater. Before the war we had no more than the framework of a health organization to cope with the nation's needs; during the war, military, industrial, and scientific expansion has made the United States the most powerful nation in the world. We know now that our estimates of need were puny by comparison with our capacity to create a healthy nation.

Among the numerous wartime pro-

grams which should now be built into the permanent programs of state and local health agencies, rapid treatment facilities for venereal diseases and malaria control are of immediate significance.

Scientific advances during the war have revolutionized the program for syphilis control. Formerly conducted as an out-patient service, syphilis therapy, with the use of penicillin, must be developed as an in-patient service, either in special centers or general hospitals. Perhaps more costly at the outset, rapid treatment ultimately will prove the most economical and effective system of control. The speed with which infectious cases can now be given complete treatment implies that the prevalence of syphilis can soon be reduced to manageable volume. Recent experience indicates that in neurosyphilis, penicillin will give excellent results when methods have been perfected.

The final attack on malaria in the South has gained marked headway during the war. Until 1945, malaria control was carried by the Public Health Service as a wartime activity. The extended program authorized for 1945 by Congress has made it possible to try new methods on a wide scale, using the war-developed insecticide, DDT. The job of eradicating malaria—and hence of preventing its reintroduction by returning veterans—no longer can be thought of as the vast and costly undertaking we feared. The use of DDT insures the control of malaria and other insect-borne diseases by means of speedier and relatively inexpensive operations. To take full advantage of the new methods, malaria control should be transferred to the peacetime health program and a larger part of it should be done by the states.

If current malaria control activities are not interrupted, but are continued efficiently, there is every reason to pre-

dict that the return of infected veterans will not result in the establishment of the disease in noninfected areas, nor in retardation of the decline of malaria in endemic areas. In this connection it is safe to say also that if reasonable safeguards are maintained, other exotic diseases will not be established in the United States. Nearly two years of intensive research in the National Institute of Health have provided much basic knowledge upon the potential dangers of all the exotic diseases which have beset the American fighting forces abroad. Upon this information, it will be possible to draft the plans for dealing promptly with new infections in those environments favorable to their establishment.

#### PLANNING PUBLIC HEALTH WORKS

The victory over the Japanese, which came sooner than all but a few could anticipate, has released for peacetime endeavors enormous energies, material resources, and man power. If these constructive forces are to be used fully and wisely in our democratic society, greater responsibility for planning and coordination must be assumed by state and local governments. No longer can the country look to the federal government as the sole agency for charting the course of action. In war, many responsibilities must be assumed, many decisions made by the central authority. In peacetime, these functions are rightly shared by all responsible agencies, with the states and localities taking a major part.

In the health field, the concept of state responsibility for planning has been written into several important bills now before the United States Congress. The Hill-Burton Bill to establish a hospital construction program provides specifically for the submission of plans through a state survey and planning authority; it would also authorize funds to assist states in drafting their

construction programs. Several bills to subsidize the construction of water supply and sewage systems make comparable provisions for state initiative in planning.

The provisions of the Surplus Property Disposal Act of 1944 require that states and localities estimate their needs for surplus property on the basis of careful plans for the construction and equipment of public facilities. The Surplus Property Board also has requested the Public Health Service to assist in allocation of surplus medical supplies, equipment, and property suitable to the protection of public health for the benefit of the nation.

The Public Health Service is in a position to give additional consultative services and technical advice to the states in many phases of peacetime planning.

Restrictions on the use of most materials and of man power have been removed. It is likely that many projects will be rushed into production without the serious consideration necessary to insure that the constructions will meet the continuing needs for which they presumably are undertaken. It cannot be overemphasized that the construction of public health facilities should be undertaken on the basis of need and usefulness, rather than for the primary purpose of providing jobs and contracts in this or that area.

The availability of materials and man power makes it all the more urgent that states and localities promptly survey their needs. Some previously developed programs for the current year may have to be revised in order to capitalize on the opportunity. For example, plans for the construction of needed tuberculosis beds have been held in abeyance until this time. I have mentioned before the lack of adequate facilities for follow-up, isolation, treatment, and rehabilitation. Now is

the time to press for the construction of tuberculosis facilities, as well as for staffing the large control organization we need.

Planning for public health work must include more than construction. If we are to build permanently for a complete health program, thought must be given to the large problems of personnel and organization. To satisfy the needs in individual states, integrated systems of facilities and services must be developed along with the plans for construction.

#### TRAINING AND PERSONNEL

Based upon information from the states, the Public Health Service has estimated that nearly one-fourth of the established positions in state and local health departments were vacant as of July 26, 1945. Twelve per cent of the positions had never been filled, while 11 per cent were vacant as a result of inductions into the armed forces, resignations, and other reasons. The greatest proportionate shortages were in public health engineers (with half of the positions in this category being vacant), medical officers, dental administrators, public health nurses, and sanitarians.

These vacancies will be multiplied many times when state and local health organizations begin to expand their programs. To staff the growing health army is an immediate and urgent task. A vigorous program of recruitment and training should be undertaken by all the agencies concerned—the Public Health Service, state and local agencies, schools of public health, and private foundations. Many important problems must be solved to put such a program into effect.

To meet the demands, it will be necessary to expand public health training facilities. An important question now being studied by the schools, the Public Health Service, and its Committee on

Postwar Training, and the American Public Health Association is: in what ways may the schools of public health be strengthened to meet future demands?

The federal government has a responsibility to aid in the expansion of public health training. Not only does the public welfare demand more and better trained personnel in the health field, but our obligations to the United Nations require that we share our skills with the health personnel of other nations. At present, specific needs in all of the war ravished areas are not fully known. That grave health problems exist is known—especially in China. Training of personnel both from our own country and our Allies is an urgent need.

The remarkable success of the wartime nurse education program in recruiting and training more than 150,000 nurses and in providing postgraduate training for 16,000 others has shown the need for some type of post-war federal aid in nurse education. Such assistance, both at the undergraduate and postgraduate levels, should be aimed at: (1) improving standards in nurse education; (2) training more nurses in those specialties where the greatest shortages exist; and (3) providing financial aid for needy students. The objective of such a program would be to make the nursing schools educational institutions in fact, and not recruitment centers for the hospital's service personnel.

#### EXPANSION OF HEALTH SERVICES

Now, if ever, state and local health officials must aim for the broad objective, namely, equal opportunity for all the people to obtain complete health and medical services. The public demands it; legislative authorities have recognized the needs by introducing in the 79th Congress no less than 121 bills related to public health. A recent

statement by Governor Ellis Arnall of Georgia is to the point:

"During the past four years, public services have been limited to minimum needs for education, public health, and public assistance. The physical plants of all units of government—highways, public buildings, sanitary facilities, hospitals, are in poor condition throughout the nation.

"This presents a challenge to state governments to meet needs within their spheres promptly. If they do not do so, they will create a vacuum into which the federal government must inevitably move in response to urgent public demand. Decentralization is not an excuse for a static inaction. It will not be accepted as an excuse by the people of the various states. The public has strong objections to centralization, but it has an even stronger antipathy for slothful neglect of vital services."

We should see in the earliest postwar years a nation-wide expansion and intensification of health services. As a first task, basic health organization should be expanded to cover every part of the country in accordance with the recommendations of the American Public Health Association.<sup>1</sup> Cancer control programs to provide diagnosis and treatment should be developed. Dental care services for children, pregnant women, and lactating mothers should be established. Public health nursing programs can be expanded to include bedside care as a visiting service. Intensified tuberculosis and venereal disease control programs should utilize fully the new methods developed during the war.

Two bills now before the Congress—the Miller Bill and the Wagner-Murray-Dingell Bill call for appropriations which are greatly in excess of any previously proposed. Should these proposals become law, shall we be able to render the services provided, under present administrative patterns?

Health agencies have not yet realized their potentialities of scientific advancement and public support. The difficulties of wartime are not solely

responsible for the lag. If we health men and women are to merit the title of public servant, we must immediately take the leadership in our own areas to find the ways through which the highest quality of health and medical services can be rendered to all of the people. The principles of tax supported service, of prepayment for medical care, and of social insurance have been generally accepted in the United States, and have been applied in various programs. The public health services, the voluntary insurance schemes, and compulsory insurance against the risks of unemploy-

ment and old age, respectively represent these principles. The issue appears to have narrowed: How may these principles be applied to develop a complete national health program? The answer lies in doing more of what we have been doing, and doing it better; in shaking the dust out of our traditions; and in accepting the new. We must move forward more rapidly toward our goal of good health for all the people of our mighty nation.

#### REFERENCE

1. Emerson, Haven, and Luginbuhl, Martha. *Local Health Units for the Nation*. A report of the Committee. New York: Commonwealth Fund, 1945.

---

## Baruch Proposes New Veterans' Medical Setup

Bernard M. Baruch of Washington, in a report on the Veterans' Administration released in early September, proposed a basic change in the setup of the Veterans' Administration in order to separate its medical and non-medical functions. Studying this problem at the request of former President Roosevelt, some of the points recommended by Mr. Baruch are summarized as follows:

There should be a clean-cut division within the veterans' agency between medical and non-medical matters, creating a new veterans' medical service under the head of an outstanding medical man.

There should be a small, fast-working independent committee to make an impartial study of every aspect of

veterans' medical care, to submit a public report of recommendations for completely transforming the new veterans medical service to one that provides a challenge to all that is progressive in medical practice.

There should be substantial increases in salaries of doctors, nurses, and technicians in the new medical service; promotion on professional ability and skill, against waiting in the line of seniority; freeing doctors of needless paper work through more efficient hospital administration; ample opportunities for doctors to grow professionally through postgraduate and refresher studies and through effective ties with centers of medical education and skill; ample research facilities and encouragement of research by veterans' doctors.

# Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides

Including Certain Exotic Types \*

W. McD. HAMMON, M.D., DR.P.H., AND W. C. REEVES, PH.D.

*The George Williams Hooper Foundation, University of California,  
San Francisco, Calif.*

TWO years ago, at the meetings of this Association in St. Louis,<sup>1</sup> we reported transmission of the Western equine and St. Louis encephalitis viruses either from chicken to chicken or from duck to chicken by a mosquito, *Culex tarsalis* Coq. This *Culex* mosquito had been found naturally infected with each of these viruses. In that paper we outlined the evidence incriminating barnyard fowl as the main source of mosquito infection. Since then considerable additional field and laboratory data have been accumulated in respect to the epidemiology of these two diseases. In addition, during this interval, some important progress has been made in the study of several of the exotic members of the arthropod-borne group of virus encephalitides. Even though some of these diseases have not yet been encountered or possibly recognized in the United States, it seems particularly appropriate at a time when rapid worldwide travel and movement of large numbers of men are assuming tremendous proportions that the available knowledge of the epidemiology of this group of diseases be presented. The potentialities

involved in the possible introduction into the United States of certain members of this group of viruses are important, and our own epidemics of the St. Louis area in 1933,<sup>2</sup> of the middle Northwest in 1941,<sup>3</sup> and smaller but uncontrolled annual outbreaks in several western states have left us with no small sense of insecurity in regard to our known "native" viruses.

## ST. LOUIS TYPE ENCEPHALITIS

We have now isolated the St. Louis virus from eight pools of naturally infected *Culex tarsalis* mosquitoes from the Yakima Valley, Wash., three in 1941,<sup>4</sup> four in 1942,<sup>5</sup> and one in 1944. In addition, one strain was isolated from *Culex pipiens* Linnaeus caught in Washington in 1942,<sup>5</sup> and one strain has just been isolated (1944) from *Aedes dor-*

The original work reported here was carried out in collaboration with the commission on Neurotropic Virus Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, United States Army; and under a contract recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the University of California. Aided by a grant from the National Foundation for Infantile Paralysis.

\* Based upon a paper presented before the Epidemiology Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

*salis* (Meigen) caught in Kern County, Calif. This latter is the first isolation of St. Louis virus from any source in California, although serologic evidence of its presence had been repeatedly obtained.<sup>6-8</sup> It is also the first isolation of St. Louis virus from an *Aedes* mosquito. Since transmission has been demonstrated in the laboratory for *Culex tarsalis* and *C. pipiens*, these we consider established vectors.<sup>9</sup> No tests of the vector ability of *Aedes dorsalis* have been made, but we have demonstrated transmission by four other *Aedes* species: *A. lateralis* (Meigen), *A. taeniorhynchus* (Wied), *A. vexans* (Meigen), and *A. nigromaculis* (Ludlow).<sup>9</sup> In addition to these *Aedes*, two species of *Culiseta* and two other *Culex* species have transmitted the disease experimentally.<sup>9</sup> A Japanese report of 1940 has just come to our attention which records transmission of St. Louis virus by *Culex tritaeniorhynchus* Giles and *Aedes albopictus* (Skuse), in addition to the previously reported *Culex pipiens* var. *pallens* Coq.<sup>10</sup>

Further studies on the feeding habits of the suspected mosquito vectors which we have made in Washington,<sup>11</sup> Nebraska,<sup>12</sup> and California<sup>13</sup> all confirm that the two *Culex* mosquitoes found infected feed predominately on fowl, so their probable source of infection is further established. More detailed laboratory tests on inoculated chickens, not previously reported, have shown that a very high dilution of St. Louis virus, representing only a 50 per cent end point dose for a mouse by the intracerebral route, will when inoculated subcutaneously in a chicken give rise regularly to virus in the blood in a titer greater than that inoculated, usually for a period of 2 or 3 days, occasionally for as long as 4 days. No mammal thus far tested has proved to be as good a potential source of mosquito infection.

However, despite this apparently satisfactory and well established con-

cept of the epidemiology of this disease (mosquito-fowl-mosquito and occasionally a biologically aberrant infection mosquito to man or horse), the story is quite incomplete. The chicken and other birds tested show no evidence of ability to serve as chronic or latent carriers of the virus. Hibernating *Culex tarsalis* and *Culex pipiens* collected during winters in Washington<sup>5</sup> and California<sup>13</sup> have not been found infected so far, though 5,429 have been tested. These results do not support our early hypothesis of winter carry-over<sup>14, 15</sup> based on the fact that many *Culex* hibernate as adults. In addition, we have tested the eggs and progeny of infected *Culex tarsalis* and *Culex pipiens* and found no evidence of transovarian passage of the virus. Therefore, the true reservoir or the whereabouts of the virus during the winter and during the seasons when there is no apparent infection is entirely unknown.

The true reservoir for the virus might be either vertebrate or arthropod. Inoculation of a wide variety of vertebrates by dermal routes has not afforded any results suggesting a true reservoir state, but Blattner and Heys<sup>16</sup> found that experimentally infected dog ticks (*Dermacentor variabilis* (Say)) were capable of transmitting the infection and that transovarian infection occurred, thus suggesting a potential reservoir. However, no naturally infected ticks have been found and there is little to suggest that the dog might serve as a link in a tick infection chain. Moreover, *D. variabilis* is unlikely at any stage in its development to infect fowl. In 1943 we thought we had an answer to the problem when a heavy chicken tick (*Argas persicus* (Oken)) infestation was discovered in the San Joaquin Valley. However, none has been found infected among 2,958 tested during 1943 and 1944. Experiments on transmission in the laboratory are now under way.

Just as this paper was being written,



Smith, Blattner, and Heys,<sup>17</sup> from St. Louis, reported by personal correspondence that they had isolated St. Louis virus on three different occasions from chicken mites (*Dermanyssus gallinae* (De Geer)). Since mites and ticks belong to the same order of arthropods and are known to transmit other pathogenic agents transovarially, this may be an important discovery. However, their ability to transmit this virus by bite must yet be demonstrated; also demonstration of infection in their progeny must be shown.\* Moreover, during the summer of 1944, in one epidemic area in California, we failed to find this parasite in chicken houses, though a pool of mosquitoes infected with the St. Louis virus was found at the time the search was made. Furthermore, over 20,000 of these chicken mites were tested from the Yakima Valley, Washington, during August, 1944, with negative results. During the same period of time St. Louis virus was isolated from the 450 *Culex tarsalis* tested.

We conclude then, that in those areas studied St. Louis virus is frequently transmitted to man by mosquitoes, principally *Culex tarsalis* and *Culex pipiens*, which have become infected in most instances by feeding on recently infected fowl. The true reservoir or winter carry-over mechanism is still unknown but may very likely be another ectoparasite of fowl or other birds, such as a tick or a mite.

#### WESTERN EQUINE TYPE ENCEPHALOMYELITIS

Progress on the epidemiology of this disease in recent years has followed almost parallel to that of St. Louis encephalitis. In fact, in most respects, the epidemiology and the clinical manifes-

tations (in man) appear to be practically identical.<sup>1, 18</sup>

We have isolated the Western equine virus from mosquitoes far more frequently than the St. Louis type. From *Culex tarsalis* alone, it was found five times in 1942<sup>4</sup> and 41 times in 1943<sup>5</sup> from collections made in the Yakima Valley, Washington; 28 times from the San Joaquin Valley, in California, in 1943<sup>13</sup> and once from eastern Nebraska in 1943<sup>12</sup> (a total of 75 isolations). In addition, two isolations were made from *Aedes dorsalis*<sup>13</sup> and one each from *Culex stigmatosoma* Dyar,<sup>13</sup> *Culex pipiens*,<sup>5</sup> *Culiseta inornata* Will,<sup>5</sup> and *Anopheles maculipennis freeborni* Aitken.<sup>5</sup> It will be recalled that Kitselman and Grundmann<sup>10</sup> recovered this virus from a cone-nosed bug (*Triatoma sanguisuga* LeConte) in Kansas. No isolation has been made by us or others from naturally infected ticks, mites,† flies, fleas, lice, bed bugs, or other arthropods excepting mosquitoes and *Triatoma*. Transmission by the bite of *Culex tarsalis* from fowl to fowl in the laboratory,<sup>1, 20</sup> finding 50 per cent of the fowl with antibodies in certain epidemic or epizootic areas,<sup>21, 22</sup> knowledge of the special predilection that *Culex tarsalis* has for the blood of fowl<sup>11</sup> and finding it naturally infected 75 times in three widely separated states, support strongly the importance of the rôle it must play. Moreover, the known distribution of this vector fits quite well the known distribution of the virus in the United States. However, since we have found five other species of mosquitoes (4 genera) infected one or more times, and thirteen species<sup>15, 20</sup> (3 genera) have been shown capable of experimental transmission, the range of mosquito vector possibilities is great. The same Japanese workers reporting

\* This latter has now been reported, but not the former (Smith, M. G., Blattner, R. J., and Heys, F. M. *Proc. Soc. Exper. Biol. & Med.*, 59:136, 1945). Experiments in our laboratory on transmission have been negative.

† Since writing this, Sulkin (*Science*, 101:381, 1945) has reported isolation from the mite, *Dermanyssus gallinae*.

St. Louis virus transmission also report transmission of the Western equine virus by *Culex pipiens* var. *pallens* (consistently found negative by American workers) and by *Armigeres obturbans* (Walk).<sup>10</sup>

For Western equine virus as for St. Louis virus the same problem of a true reservoir or method of carry-over from season to season remains unsolved. We have found no infected mosquitoes in the winter, have demonstrated no transovarian infection in mosquitoes, and found no indication of the persistence of a latent infection in any mammal. Syverton and Berry<sup>23</sup> were able to infect wood ticks (*Dermacentor andersoni* Stiles) and demonstrated transovarian infection,<sup>24</sup> but again in this case in tests made by others in an epizootic area,<sup>25, 26</sup> no infected ticks have been found, and in five areas which we have surveyed these ticks are either entirely absent or present in extremely small numbers, and none of those found was infected. We have tested large numbers of chicken ticks (*Argas persicus*) and found none infected. However, in our laboratory, experimental infection in the chicken tick has persisted for at least 12 days, but transmission tests are not yet complete.

The first two isolations of the Western equine virus from *Aedes* mosquitos, (*A. dorsalis*) collected in the San Joaquin Valley in 1943<sup>13</sup> deserve some further consideration because interest has centered on this genus since Kelser effected the first mosquito transmission with *Aedes aegypti* (Linn).<sup>27</sup> We have tested to date 25,162 *Aedes* mosquitoes from five western, midwestern, and southwestern states, and have isolated the Western equine virus only twice, a rate of 1 in 12,500. In contrast, the infection rate in *Culex tarsalis* in one area in Kern County, California, has been at least one in eighteen (6 isolations from 6 pools composed of 10- or 25 mosquitoes each). These were col-

lections of 1943.<sup>13</sup> The rate for all *C. tarsalis* tested during a 3 year period from 5 states is 1 in 225. Our precipitin test feeding habit studies on *Aedes*<sup>11-13</sup> help explain these findings if we accept the evidence incriminating fowl as sources of mosquito infection. Fifty to 90 per cent of the *Aedes* of various areas were found to have fed on cows or horses, and about 98 per cent on mammals of some kind. No one has reported successfully infecting a mosquito from a horse, and experimental bleedings of infected horses when occasionally positive for virus do not show titers at all comparable to chickens or ducks. We have just tested two calves and at no time following subcutaneous inoculation was virus isolated from the blood, though the infection resulted in antibody production. Neither calf had demonstrable antibodies prior to inoculation. Thus, all these findings support the great importance of fowl and *Culex* mosquitoes.

Other data, however, which we have collected from Texas<sup>28</sup> and Nebraska<sup>12</sup> throw doubt upon the rôle played by domestic fowl in these latter areas, both for Western equine and St. Louis virus infections. In Nebraska, the sera from 37 chickens tested were free from antibodies to either virus. In Texas only 8.5 per cent of 117 domestic fowl were positive to the Western equine virus, and only 4.3 per cent of 138 to the St. Louis. This is in marked contrast to 25 to 60 per cent found positive to each in Washington<sup>21</sup> and California.<sup>22, 13</sup> It should be remembered that Cox, Jellison and Hughes<sup>29</sup> found an infected prairie chicken and a deer in North Dakota in 1941, and McNutt and Packer an infected hog.<sup>30</sup> We tested 27 pheasant sera from Nebraska for antibodies to Western equine virus with negative results.<sup>12</sup> It seems likely, therefore, that the vertebrate hosts and possibly the invertebrate vectors differ from one area to another. Most of our

work has been done in hot, irrigated valley areas, less in open, dry farming lands. Much further study is required in these latter areas, but epidemics or epizootics occur in such places in an unpredictable and sporadic manner, thus making it difficult to carry out proper surveys.

#### EASTERN EQUINE TYPE ENCEPHALOMYELITIS

Outside of records of the occurrence of the Eastern equine virus in areas somewhat further west than previously, there is little new to report. An epizootic occurred in Texas in 1941 during which repeated isolations of virus were made from horses<sup>31, 32, 33</sup> and isolations were made in 1942 in Michigan and across the Canadian border.<sup>34</sup> Reports of probable human cases in Texas in 1941, based on serological tests, were reported by Bohls and Irons<sup>33</sup> and by Hammon.<sup>35, 36</sup> Serological tests which we have made on man and animals in Western areas (Nebraska, Washington, Arizona, and California) have with one exception all been negative for this virus *except in the case of cows*.<sup>28</sup> Numerous bovine sera have neutralized this virus. Without support of other evidence of the presence of this virus in the West it seems reasonable to consider this the result of a nonspecific viricidal property. A Japanese report of 1940 not previously quoted in American literature claims transmission of Eastern equine type virus by *Culex pipiens* var. *pallens* (negative reports by American workers) and by *Culex tritaeniorhynchus*.<sup>10</sup>

#### RUSSIAN SPRING-SUMMER ENCEPHALITIS

For the past forty years, at least, there has been recognized an epidemic type of human encephalitis, occurring annually in forest regions of the eastern U.S.S.R. and to a lesser degree in European Russia. It occurs only during the spring and early summer, coinciding with the activity of ticks. Russian in-

vestigators have isolated the etiological agent from man, rodents, and ticks, and have reported excellent epidemiologic studies. These reports, including some of the most recent available, were concisely reviewed in an editorial in the *Journal of the American Medical Association*<sup>37</sup> and in a review by Smadel,<sup>38</sup> so repetition here will be avoided. An even later review has appeared this year in the *American Review of Soviet Medicine*.<sup>39</sup>

Studies on the virus itself made in this country by Casals and Webster<sup>40, 41</sup> have shown it to be very similar to or identical with the virus of louping-ill of sheep in Scotland, also known to be tick-borne.\* The tick is not only the vector but the reservoir<sup>42</sup> since transovarian passage of the virus normally occurs. Accidental transportation of infected ticks (already accomplished by intent for experimental purposes<sup>41</sup>) by any means of transportation might readily establish this infection in tick-infested forest areas of our country.

Clinically, the disease differs from the rest of this group principally in respect to paralytic manifestations. Shoulder girdle paralysis or paresis is reported to occur quite frequently.<sup>39, 42</sup> Virus has been isolated from the blood, the cerebrospinal fluid, and the urine of infected persons.<sup>42</sup> Case fatality rates average about 30 per cent. The Russians have effectively used a formalinized tissue vaccine to protect man in the areas involved.<sup>43</sup>

#### JAPANESE "B" ENCEPHALITIS

The name Japanese "B" encephalitis was used to distinguish from the von Economo type which the Japanese called type "A," an epidemiologically and clinically distinct type of epidemic encephalitis which frequently occurred

\* Silber and Shubladze (*Am. Rev. Soviet Med.*, 2: 339, 1945) now report louping-ill is the tick-borne encephalitis of Western U.S.S.R., but that a different virus is responsible for tick-borne encephalitis in the Far Eastern area.

in Japan in the late summer. An excellent review of the known epidemiology and clinical aspects of this very important disease, up until about 1938, can be found in the *Third Report of the Matheson Committee on Epidemic Encephalitis*.<sup>44</sup> For various reasons Americans have taken little cognizance of this infection, but at this time a thorough understanding of its epidemiology and geographic distribution, thereby leading to an assessment of its present potentialities, is of the greatest importance. As an example of this potential importance, we have recently demonstrated the ability of six species (3 genera) of California mosquitoes to transmit the Japanese "B" virus to animals and have demonstrated its presence in the blood of inoculated chickens.<sup>45</sup> The Japanese and Russians themselves have only reported transmission by five species (2 genera).<sup>46, 47</sup> Once introduced into any of the hot valley areas where our own types of encephalitis now propagate through a mosquito-fowl-mosquito cycle, there are good reasons to believe that the Japanese disease would be a greater plague than any we have at present.

Japanese "B" encephalitis has probably occurred in epidemic form in Japan proper since the beginning of this century, or quite possibly even 30 years previously. However, not until the great epidemic of 1924, involving over 6,000 persons and with 3,797 reported deaths, did it attract much attention. Since then annual epidemics have been recorded, sometimes from numerous regions. Between 1924 and 1937, from Japan alone, 21,355 cases with 12,159 deaths were reported.<sup>44</sup> Case fatality rates have ranged from 42 to 75 per cent, but have averaged about 60 per cent. Epidemics or sporadic cases have also been reported from Formosa,<sup>44</sup> the Southern Ryukyu Islands,<sup>44</sup> eastern China,<sup>48</sup> and the eastern U.S.S.R.<sup>49</sup> Smithburn and Jacobs<sup>50</sup> report as a

result of serological tests that "the St. Louis and Japanese 'B' viruses have been active over broad expanses of territory in Central Africa." Sabin<sup>51</sup> raises a difficult question by reporting a number of positive serological tests for Japanese "B" virus in the Cincinnati area.

As an example of infection rates, in May, 1938, 4 persons entering Tokyo from a non-epidemic area were found to be antibody free. During the summer epidemic one became clinically ill and developed specific antibodies, two others developed antibodies and only one escaped uninfected. A number of dogs similarly studied developed antibodies, and several virus isolations were made from their blood.<sup>52</sup>

Smorodintseff<sup>49</sup> has recently written a report of very careful epidemiological and laboratory studies made in epidemic areas in Siberia in which he showed that this disease, which he calls "Autumn Encephalitis" is not the same as the Russian Spring-Summer type, but is identical with the Japanese "B" type. In recent conversations which one of us has been privileged to have with Dr. Smorodintseff he reported that there is no literature available which gives an adequate idea of the importance of this disease throughout many sections of this tremendous part of the Far East. He expressed the view that it might be unwise to permit *unvaccinated* persons, civilian or military, to enter the epidemic areas in the summer because of the high morbidity and mortality rates, and also because of the large numbers of mild unrecognized infections which could serve as temporary carriers. He had suggested the probable effectiveness of a formalinized mouse brain vaccine in one of his publications<sup>49</sup> and its use is recommended in another Russian report,<sup>47</sup> but we have found no printed record of its actual use. Sabin,<sup>51</sup> however, has prepared such a vaccine for experimental use in man.

The problem of possible introduction of this virus into an area where vectors are present appears to be quite similar to that presented by yellow fever, but it has not been so well publicized or guarded against. In fact, a well accepted authority on exotic diseases recently stated before a Special Session of this Association in a discussion on the introduction of exotic diseases into this country, that "of the exotic virus diseases there is only one which needs special consideration—yellow fever."<sup>53</sup> Airplane transport of either an infected mosquito or of a man in the incubation period might be the means of introducing either of these viruses into a new area.

The virus of Japanese encephalitis has been isolated from *Culex pipiens* var. *pallens* and *Culex tritaeniorhynchus* in epidemic areas by both Russian<sup>47</sup> and Japanese workers,<sup>54</sup> and both these *Culex* with the addition of *Aedes togoi* Theobald, *Aedes albopictus* and *Aedes japonicus* Theobald have been shown capable of transmitting the disease to mice or monkeys in the laboratory.<sup>46, 47</sup> Moreover, it is reported from Japan,<sup>55, 52</sup> (and Dr. Smorodintseff reported verbally that he had confirmed the work) that mosquitoes reared in the laboratory from larvae or eggs collected in an epidemic area were occasionally infected. We have had negative results in attempting to demonstrate transovarian infection of Japanese virus in *C. pipiens* and other mosquitoes infected in the laboratory. However, Dr. Smorodintseff warned that this and many of the other observations reported from the Far East for Japanese "B" encephalitis must be accepted with caution, for a virus encephalomyelitis infection of mice somewhat similar to Theiler's virus is encountered in laboratory mouse colonies in the East which clinically, in animal susceptibility range, and even serologically cannot be readily differentiated from Japanese "B" virus.

A Japanese report, just recently encountered, confirms the findings reported verbally by Dr. Smorodintseff in respect to a spontaneous mouse virus. Kawamura, *et al.*<sup>56</sup> isolated repeatedly what they identified pathologically and serologically as Japanese "B" virus from mice purchased from several dealers. Since many of the Japanese claims of virus isolation and mosquito transmission are based on the demonstration of virus after two to six "blind" serial passages of mouse brain, much of their work cannot be accepted as conclusive or final.

It seems probable, however, that mosquitoes have been infected by feeding on human patients and inoculated laboratory animals, and have transmitted the virus by biting; and that virus has been isolated from the blood of naturally infected man, domestic animals,\* and laboratory animals, even when no manifest disease was present. In addition there is one report of a virus isolation from human saliva.<sup>52</sup> It becomes obvious therefore, that this virus may have many temporary reservoirs and many mosquito vectors. It commands respect as a dangerous disease. To prevent its establishment from accidental introduction we must control more than *Anopheles* and *Aedes aegypti* near air and sea ports. The genus *Culex* and certain other genera can no longer be considered harmless pests.

#### VENEZUELAN EQUINE ENCEPHALOMYELITIS

Kubes and Rios<sup>57</sup> and Beck and Wyckoff<sup>58</sup> isolated a virus from cases of equine encephalomyelitis from Venezuela in 1938. It has been recognized also in Colombia,<sup>59, 60</sup> Ecuador,<sup>61</sup> and

\* Since writing this, information has become available from the U.S.S.R. that virus has been found in the blood of birds, and that 35 per cent of horses of affected areas have antibodies. It is concluded that the natural reservoir of the virus is birds and horses. (Rosenthal and Laval. *Am. Rev. Soviet Med.*, 2:166, 1944, quoting from Shubladze, A. K., *J. microbiol. epidemiol. immunobiol.*, 1-2:87-89, 1943.)

more recently in Trinidad.<sup>61, 62</sup> Several early reports reviewed by Gallia and Kubes<sup>63</sup> suggest that cases may have occurred in man in epidemic areas, but not until August, 1943, when a U. S. Navy seaman developed a fatal infection in Trinidad, was such a case definitely proved by isolation of the virus.<sup>62, 64</sup> Prior to this, in November, 1942, two laboratory workers in New York<sup>65</sup> developed mild infections, and in July, 1943, 8 laboratory workers in Rio de Janeiro developed a similar illness, one of a severe nature.<sup>66</sup> In another laboratory in Caracas, Venezuela, by means of the neutralization test, past unrecognized infection was detected in 8 persons who had worked with the virus or handled diseased animals.<sup>63</sup> It is particularly notable in the reports from New York and Brazil that the virus was isolated from the blood of 7 of the laboratory cases (from 5 on the second day of illness, from 1 on the third and from 1 on the fifth day). Virus was also isolated from the nose or throat washings in 2 cases, both taken on the second day of illness.

Epidemiologically, mosquitoes have been incriminated in the natural equine infections<sup>62</sup> and several potential vectors have been demonstrated.<sup>67, 62</sup> Gilyard found *Mansonia tittilans* Walker naturally infected in Trinidad and demonstrated experimental transmission with the same species.<sup>62</sup> *Mansonia tittilans* is a common mosquito in our southeastern states and is found as far west as Texas.

The mosquitoes used in Gilyard's experiment were infected by application to an infected donkey colt. This, so far as we are able to determine, is the first demonstrated instance of mosquito infection from a large mammal with any of the equine viruses and we are of the opinion that it rarely or never occurs in the Western equine infection, at least. Here then, is another arthropod-borne virus encephalitis affecting man, with

large mammals including horses and men among the hosts from which mosquitoes may become infected. Similar in this respect is the Japanese "B" virus. In addition the possibility of person-to-person droplet infection has been indicated.<sup>65, 66</sup> Recent spread has probably occurred across water from Ecuador to Trinidad<sup>62</sup> and it is easy to conceive of its spread by ship or plane or by island hopping to our Gulf Coast where *Mansonia tittilans*, one known vector, is already present. One member of our armed forces has already succumbed to the infection in a foreign country. Thus, another disease in this group deserves establishment of immediate preventive action.

#### OTHER VIRUSES POSSIBLY OR PROBABLY BELONGING IN THE GROUP

Smithburn and associates<sup>68</sup> isolated a virus, which they have called the West Nile virus, by the intracerebral inoculation of mice with serum from a mildly febrile woman in Uganda, Africa. It produces encephalitis in the mouse, the monkey, and the hamster.<sup>69</sup> Philip and Smadel<sup>70</sup> have transmitted the virus in the laboratory by the bite of *Aedes albopictus* mosquitoes. The virus is related immunologically to the St. Louis-Japanese "B" group.<sup>71</sup> Smithburn and Jacobs<sup>50</sup> report what they believe to be specific antibodies for this virus in man from a large area in Central Africa.

A group of cases of human encephalitis occurred during Army field training in Texas in 1941 which were clinically identical to Western equine and St. Louis encephalitis, yet these patients failed to develop antibodies to either of these viruses or to the Eastern equine strain.<sup>72</sup> We have repeatedly seen cases of unknown etiology in Texas,<sup>28, 36</sup> Washington<sup>5, 73</sup> and California, occurring at the same time as others which could be etiologically diagnosed. No increase in antibody titer could be demonstrated in the sera of these pa-

tients for the viruses known to be present in the United States. We have, therefore, felt it necessary to postulate the existence of one or more as yet unidentified viruses belonging in this group.

Bugher and associates<sup>74</sup> report having isolated two unidentified viruses by the intracerebral inoculation of mice from mosquitoes caught in Colombia. They called the viruses Sabethine 1, and Anopheles 1, from the genus of mosquitoes from which they were isolated. In the summer of 1943 we isolated from *Aedes dorsalis* mosquitoes caught in Kern County, California, an unidentified virus (BFS-91) which produces encephalitis in mice, cotton rats, and hamsters, and which can be cultivated by various methods in the chick embryo. All attempts to identify it so far have failed. Sera from a number of encephalitis patients and from domestic and wild animals from the area in which it was found have neutralized it in protection tests.

In 1944 from the same area and from the same species of mosquitoes, another virus (BFS-283) has been isolated, which also has proved to be difficult to identify, and in all probability is identical to BFS-91.\*

Evidence therefore is accumulating that there are a large number of arthropod-borne neurotropic viruses of man and other animals, and that they are of world-wide distribution, and of no small importance.

\* Three viruses proven to be immunologically identical have now been isolated from *Aedes dorsalis* and *Culex tarsalis* of this area.

#### REFERENCES

1. Hammon, W. McD., Reeves, W. C., and Gray, M. Mosquito Vectors and Inapparent Animal Reservoirs of St. Louis and Western Equine Encephalitis Viruses. *A.J.P.H.*, 33:201-207 (Mar.), 1943.
2. Report on the St. Louis Outbreak of Encephalitis. *Pub. Health Bull.*, 214 (Jan.), 1935.
3. Leake, J. P. Epidemic of Infectious Encephalitis. *Pub. Health Rep.*, 56:1902-1905, 1941.
4. Hammon, W. McD., Reeves, W. C., Brookman, B., and Izumi, E. M. Mosquitoes and Encephalitis in the Yakima Valley, Washington. 1. Arthropods Tested and Recovery of Western Equine and St. Louis Viruses from *Culex Tarsalis* Coquillett. *J. Infect. Dis.*, 70:263-266 (May-June), 1942.
5. Hammon, W. McD., Reeves, W. C., Benner, S. R., and Brookman, B. Human Encephalitis in the Yakima Valley, Washington, 1942, with Forty-nine Virus Isolations (Western Equine and St. Louis Types) from Mosquitoes. *J.A.M.A.*, in Press.
6. Howitt, B. F. Viruses of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California 1937-1938. *A.J.P.H.*, 29:1083-1097 (Oct.), 1939.
7. Wynns, H. L., and Hawley, C. J. Epidemiology of Epidemic Encephalitis in California, *A.J.P.H.*, 29:781-786 (July), 1939.
8. Howitt, B. F. Human Equine Encephalomyelitis and St. Louis Encephalitis in California, 1939-1941. *A.J.P.H.*, 32:503-515 (May), 1942.
9. Hammon, W. McD., and Reeves, W. C. Laboratory Transmission of St. Louis Encephalitis Virus by Three Genera of Mosquitoes. *J. Exper. Med.*, 78:241-253 (Oct.), 1943.
10. Mitamura, T., Kitaoka, M., Watanabe, S., Iwasaki, T., Ishikawa, I., Tenjin, S., Jo, K., Yoshida, H., Yoshimatsu, D., Warabioka, K., Shimizu, M., and Watanabe, T. Über die Bedeutung der Mücken für die Übertragung verschiedener Enzephalitis Virusarten. *Tr. Soc. path. jap.*, 30:561-570, 1940.
11. Reeves, W. C., and Hammon, W. McD. Feeding Habits of the Proved and Possible Mosquito Vectors of Western Equine and St. Louis Encephalitis in the Yakima Valley, Washington. *Am. J. Trop. Med.*, 24:131-134 (Mar.), 1944.
12. Hammon, W. McD., Reeves, W. C., and Galindo, P. Epidemiology of Western Equine Type Encephalomyelitis: Nebraska Survey of 1943 with Isolation of the Virus from Mosquitoes. *Am. J. Vet. Res.*, 6:145-148. (July), 1945.
13. Hammon, W. McD., Reeves, W. C., and Galindo, P. Epidemiologic Studies of Encephalitis in the San Joaquin Valley of California, 1943, with the Isolation of Viruses from Mosquitoes. *Am. J. Hyg.* In Press.
14. Hammon, W. McD., Reeves, W. C., Brookman, B., and Izumi, E. M. Isolation of the Viruses of Western Equine and St. Louis Encephalitis from *Culex Tarsalis* Mosquitoes. *Science*, 94:328-330 (Oct. 3), 1941.
15. Hammon, W. McD., Reeves, W. C., Brookman, B., and Gullin, C. M. Mosquitoes and Encephalitis in the Yakima Valley, Washington. V. Summary of Case Against *Culex Tarsalis* Coquillett as a Vector of the St. Louis and Western Equine Viruses. *J. Infect. Dis.*, 70:278-283 (May-June), 1942.
16. Blattner, R. J., and Heys, F. M. Blood-Sucking Vectors of Encephalitis: Experimental Transmission of St. Louis Encephalitis (Hubbard Strain) to White Swiss Mice by the American Dog Tick, *Dermacentor variabilis* Say. *J. Exper. Med.*, 79:439-454, 1944.
17. Smith, M. G., Blattner, R. J., and Heys, F. M. The Isolation of the St. Louis Virus from Chicken Mites (*Dermanyssus gallinae*) in Nature. *Science*, 100:362-363 (Oct. 20), 1944.
18. Hammon, W. McD. The Epidemic Encephalitis of North America. *M. Clin. North America*, 27:632-650 (May), 1943.
19. Kitselman, C. H., and Grundmann, A. W. Equine Encephalomyelitis Virus Isolated from Naturally Infected *Triatoma sanguisuga* LeConte. *Kansas Agri. Exp. Sta. Tech. Bull.*, 50:1, 1940.
20. Hammon, W. McD., and Reeves, W. C. Laboratory Transmission of Western Equine Encephalomyelitis Virus by Mosquitoes of the Genera *Culex* and *Culiseta*. *J. Exper. Med.*, 78:425-434 (Dec.), 1943.

21. Hammon, W. McD., Lundy, H. W., Gray, J. A., Evans, F. A., Bang, F., and Izumi, E. M. A Large-Scale Serum-Neutralization Survey of Certain Vertebrates as Part of an Epidemiological Study of Encephalitis of the Western Equine and St. Louis Types. *J. Immunol.*, 44:75-86 (May), 1942.
22. Howitt, B. F., and Van Herick, W. Relationship of the St. Louis and the Western Equine Encephalitic Viruses to Fowl and Mammals in California. *J. Infect. Dis.*, 71:179-191, 1942.
23. Syverton, J. T., and Berry, G. P. An Arthropod Vector for Equine Encephalomyelitis, Western Strain. *Science*, 84:186-187, 1936.
24. Syverton, J. T., and Berry G. P. Hereditary Transmission of the Western Type of Equine Encephalomyelitis Virus in the Wood Tick, *Dermacentor andersoni* Stiles. *J. Exper. Med.*, 73:507-530, 1941.
25. Gwatkin, R. Further Examination of Small Mammals and Birds in a Search for Carriers of Equine Encephalomyelitis Virus. *Canad. J. Comp. Med.*, 5:113-116, 1941.
26. Gwatkin, R., and Moynihan, I. W. Search for Sources and Carriers of Equine Encephalomyelitis Virus. *Canad. J. Research*, 20:321-337, 1942.
27. Kelser, R. A. Mosquitoes as Vectors of the Virus of Equine Encephalomyelitis. *J. Am. Vet. M. A.*, 82:767, 1933.
28. Hammon, W. McD., Reeves, W. C., and Irons, J. V. Survey of the Arthropod-Borne Virus Encephalitis in Texas with Particular Reference to the Lower Rio Grande Valley in 1942. *Texas Rep. on Biol. and Med.*, 2:366-375 (Winter), 1944.
29. Cox, H. R., Jellison, W. L., and Hughes, L. E. Isolation of Western Equine Encephalomyelitis Virus from a Naturally Infected Prairie Chicken. *Pub. Health Rep.*, 56:1905, 1941.
30. McNutt, S. H., and Packer, A. Isolation of Western Equine Encephalomyelitis and Hog-Cholera Viruses from Supposedly Hog-Cholera Immune Swine. *Vet. Med.*, 38:22-25, 1943.
31. Randall, R., and Eichorn, E. A. Westward Spread of Eastern Type Equine Encephalomyelitis Virus. *Science*, 93:595, 1941.
32. Mohler, J. R. Report of the Chief of the Bureau of Animal Industry, U. S. Department of Agriculture. *In Mimeo*, Sept. 15, 1941.
33. Bohls, S. W., and Irons, J. V. Laboratory Observation on Virus Encephalitis. *Texas State J. Med.*, 38:260-264, 1942.
34. Mohler, J. R. Report on Infectious Equine Encephalomyelitis in the United States in 1942. Report of Chief of The Bureau of Animal Industry, U. S. Department of Agriculture. *In Mimeo*, March 1, 1943.
35. Hammon, W. McD. Animal Reservoirs, General Epidemiological Summary and Possible Control Measures for the American Summer Encephalitis. *Proc. Twelfth Ann. Conf., Calif. Mosq. Cont. Assoc.*, 37-51, 1941.
36. Hammon, W. McD. Encephalitis: Eastern and Western Equine and St. Louis Types as Observed in 1941 in Washington, Arizona, New Mexico and Texas. *J. A. M. A.*, 121:560-564, 1943.
37. New Developments in Knowledge of Encephalitis. Editorial, *J. A. M. A.*, 117:1361-1363 (Oct. 18), 1941.
38. Smadel, J. E. Common Neurotropic Virus Diseases of Man. *U. S. Nav. M. Bull.*, 40:1020-1036, 1942.
39. Smorodintseff, A. A. Tick-Borne Encephalitis. *Am. Rev. Soviet Med.*, 1:400-408 (June), 1944.
40. Casals, J., and Webster, L. T. Close Relation between Russian Spring-Summer Encephalitis and Louping-III Viruses. *Science*, 97:246, 1943.
41. Casals, J., and Webster, L. T. Relationship of the Virus of Louping-III in Sheep and the Virus of Russian Spring-Summer Encephalitis in Man. *J. Exper. Med.*, 79:45-63 (Jan.), 1944.
42. Smorodintseff, A. A. The Spring-Summer Tick-Borne Encephalitis. *Arch. f. Ges. Virusforsch.*, 1:468-480, 1940.
43. Smorodintseff, A. A., Kagan, N. W., Lerkovitch, E. N., and Dankovskij, N. L. Experimenteller und epidemiologischer Beitrag zur aktiven Immunisierung gegen die Frühling-Sommer-Zekenencephalitis. *Arch. f. Ges. Virusforsch.*, 2:1-25, 1941.
44. Matheson Commission, *Epidemic Encephalitis, Third Report*. Columbia University Press, New York, 1939.
45. Reeves, W. C., and Hammon, W. McD.. To Be Published.
46. Mitamura, T., Kitaoka, M., Mori, K., Okubo, K., and Tenjin, T. Über den Infektionsmodus des japanischen epidemischen Enzephalitis mit besonderer Berücksichtigung der experimentellen und epidemiologischen Beweise für die Krankheitsübertragung durch Mücken. *Tr. Soc. path. jap.*, 28:135-145, 1938. Also quoting from Mitamura, et al., *Tokyo Iji Shimishi*, 62:812-819, 1938.
47. Petrisheva, P. A., and Shubladse, A. K. The Vectors of The Autumn Encephalitis in the Maritime District (in Russian). *Arch. dis. sci. biol.*, 59:72-77 (No. 7-8), 1940.
48. Yen, C. H. Isolation of a Virus from an Acute Encephalitis Case in Peiping. *Proc. Soc. Exper. Biol. & Med.*, 46:609 (Apr.), 1941.
49. Smorodintseff, A. A., Shubladse, A. K., and Neustroev, V. D. Etiology of the Autumn Encephalitis in the Far East of the U. S. S. R. *Arch. f. Ges. Virusforsch.*, 1:37-559, 1940.
50. Smithburn, K. C., and Jacobs, H. R. Neutralization-Tests Against Neurotropic Viruses with Sera Collected in Central Africa. *J. Immunol.*, 44:9-23 (May), 1942.
51. Sabin, A. B. The St. Louis and Japanese "B" Types of Epidemic Encephalitis. *J. A. M. A.*, 122:477-486 (June 19), 1943.
52. Mitamura, T., Kitaoka, M., Watanabe, S., Hosoi, T., Tenjin, S., Seki, O., Nagahata, K., Jo, K., and Shimizu, M. Weitere Untersuchungen über die Übertragung der japanischen epidemischen Enzephalitis durch Mücken. *Tr. Soc. path. jap.*, 29:92-105, 1939.
53. Sawyer, W. A. Yellow Fever and Typhus and the Possibility of Their Introduction into the United States. *A. J. P. H.*, 34:7-14 (Jan.), 1944.
54. Inada, Ryokichi. Compte rendu des recherches sur l'encephalite epidemique du Japon. *Office Internat. d'hyg. Pub. Bull. mens.*, 29:1389-1401, 1937.
55. Mitamura, T., Yamada, S., Hazato, H., Mori, K., Hosoi, T., Kitaoka, M., Watanabe, S., Okubo, K., and Tenjin, S. Ueber den Infektionsmodus der epidemischen Enzephalitis. Experimentelle Untersuchungen über ihre Ansteckung durch Mücken. *Tr. Soc. path. jap.*, 27:573-580, 1937.
56. Kawamura, R., Kasahara, S., Miyata, T., Veda, M., and Yamada, R. On the Question of Isolation of Encephalitis Virus in Mice Bought from Animal Dealers. *Kitasato Arch. Exper. Med.*, 17:38-44, 1940.
57. Kubes, V., and Rios, F. A. The Causative Agent of Infectious Equine Encephalomyelitis in Venezuela. *Science*, 90:20-21 (July 7), 1939.
58. Beck, C. E., and Wyckoff, R. W. G. Venezuela Equine Encephalomyelitis. *Science*, 88:530 (Dec. 2), 1938.
59. Soriano Lleras, A., and Figueroa, L. Aislamiento de un virus de un caballo atacado de "peste loca" en Bogota. *Bol. Inst. nac. hig. Samper Martinez* (Aug., 1942), No. 8, pp. 3-15.
60. Kubes, V. Relaciones inmunologicas entre el virus encefalomielitico equino de Colombia y el de Venezuela. *Bol. d. Inst. Invest. Vet.*, 1:155-166 (Dec.), 1943.
61. Kubes, Vladimir. Venezuela Type Equine



Encephalomyelitis Virus in Trinidad. *Science*, 99:41-42 (Jan. 14), 1944.

62. Gilyard, R. T. Mosquito Transmission of Venezuelan Equine Encephalomyelitis in Trinidad. *Bull. U. S. Army Med. Dept.*, 75:96-107 (Apr.), 1944.

63. Gallia, Frantisek, and Kubes, Vladimir. Neutralization of the Venezuelan Encephalomyelitis Virus by Human Serums. *J.A.M.A.*, 125:894-897 (July 29), 1944.

64. Randall, Raymond, and Mills, J. W. Fatal Encephalitis in Man Due to the Venezuelan Virus of Equine Encephalomyelitis in Trinidad. *Science*, 99:225-226 (Mar. 17), 1944.

65. Casals, J., Curnen, E. C., and Thomas, Lewis. Venezuelan Equine Encephalomyelitis in Man. *J. Exper. Med.* 77:521-530 (June), 1943.

66. Lennette, E. H., and Koprowski, Hillery. Human Infection with Venezuelan Equine Encephalomyelitis Virus. *J.A.M.A.*, 123:1088-1095 (Dec. 25), 1943.

67. Roubaud, E., Lepine, C., Treillard, M., and Sautter, V. Infection Experimentale de culicides (aédines) europeens avec le virus de l'encephalomyélite equine americaine, type Venezuela. *Bull. Soc. path. exot.*, 34:130 (May-July), 1941.

68. Smithburn, K. C., Hughes, T. P., Burke, A. W., and Paul, J. H. A Neurotropic Virus Isolated from the Blood of a Native of Uganda. *Am. J. Trop. Med.*, 20:471-491 (July), 1940.

69. Watson, D. W., and Smadel, J. E. Susceptibility of Hamsters to Peripheral Inoculation of Western, Eastern and West Nile Encephalitis Viruses. *Proc. Soc. Exper. Biol. & Med.*, 52:101, 1943.

70. Philip, C. B., and Smadel, J. E. Transmission of West Nile Virus, by Infected *Aedes albopictus*. *Proc. Soc. Exper. Biol. & Med.*, 53:49-50, 1943.

71. Smithburn, K. C. Differentiation of the West Nile Virus from the Viruses of St. Louis and Japanese "B" Encephalitis. *J. Immunol.*, 44:25-31 (May), 1942.

72. Woodland, J. C., and Smith, E. M. Acute Encephalitis; Mild Epidemic Observed at Station Hospital, Fort Sam Houston, Texas. *J.A.M.A.*, 120:358 (Oct. 3), 1942.

73. Hammon, W. McD. Encephalitis in the Yakima Valley. *J.A.M.A.*, 117:161-167 (July 19), 1941.

74. Bugher, John C., Boshell-Manrique, Jorge, Roca-Garcia, Manuel, and Osorno-Mesa, Ernesto. Epidemiology of Jungle Yellow Fever in Eastern Colombia. *Am. J. Hyg.*, 39:16-51 (Jan.), 1944.

## New York State Extends Bread and Flour Enrichment Program

The New York State Legislature has passed an Act amending the Agriculture and Markets Law and establishing vitamin and mineral standards for flour, bread and rolls, to become effective January 1, 1946. New York State declares that it is unlawful for any person to manufacture, mix, compound, sell or offer for sale flour for human consumption in this state unless it contains standard amounts of thiamine, riboflavin, niacin or niacin-amide and iron.

According to *New York State Health News*, the standards established are those recommended by the Food and Nutrition Board of the National Research Council and the Federal Security Agency. The Council's optional standards for vitamin D and calcium have not been adopted, with the exception

that a minimum of 500 milligrams and a maximum of 1,500 milligrams of calcium per pound have been set for self-rising flour.

This step is in line with the resolution of the American Public Health Association adopted by the Governing Council in October, 1944 (pages 1298-1299, December, 1944, *American Journal of Public Health*), recommending that the present War Food Administration compulsory order be extended for the post-war period. The resolution points out that this enrichment in staple, low-cost foods has been of proportionately greater benefit to the economic groups whose diet is most in need of betterment.

*The American Journal of Public Health* will be glad to report similar action by other states.

# Equal-area Projections and the Azimuthal Equidistant Projection in Maps of Disease

SAUL JARCHO, MAJOR MC

*Medical Intelligence Division, Preventive Medicine Service, Office of The Surgeon General, Washington, D. C.*

THE recent increase in the study of tropical medicine has resulted in the increased study and production of maps which portray the distribution of disease. To physicians not specially trained in cartography the term "map" almost invariably suggests the familiar schoolroom map of the world on the Mercator projection, in which the terrestrial globe is represented as a cylinder. Experienced geographers, although not willing to abandon the Mercator projection,<sup>1</sup> recognize that it has several limitations or disadvantages. Those limitations which are of importance in world maps of the so-called tropical diseases may be summarized as follows <sup>2-4</sup>:

1. The Arctic and Antarctic regions are greatly exaggerated. According to a traditional example, on the Mercator projection Greenland appears to be larger than South America, although in actual fact Greenland (839,782 square miles) has approximately one-ninth the area of South America (7,045,047 square miles).

2. Since the Arctic and Antarctic regions are exaggerated, the equatorial zones appear disproportionately small. For the portrayal of tropical diseases—and especially for the portrayal of the world distribution of such diseases—this is a serious shortcoming.

3. Territories which are of equal size on a Mercator map are not necessarily equal in area. On Mercator's projection Dutch Borneo and Iceland seem to be approximately equal in size. Actually Dutch Borneo (208,000 square miles) is more than five times as large as Iceland (39,700 square miles).

4. Although Mercator maps are useful to navigators and others who desire to plot the course of a ship, most *distances* are distorted.

Despite these and other disadvantages, the Mercator projection continues to be extremely useful and is not likely to give way under the attacks to which it has been subjected. It is still of great value to navigators—for whom it was originally designed. Moreover, because of its familiarity it is destined to remain in use for such ordinary purposes as the location of places, for war maps in newspapers, and for miscellaneous diagrams. In medical work the Mercator projection can be employed when it is desirable to prepare a "spot map," e.g., a map showing the location of sporadic outbreaks of a disease, if it is not important to indicate the size of areas in which the disease has occurred. The Mercator projection also can be employed for disease maps of small areas, in which distortion is negligible.

## MALARIA

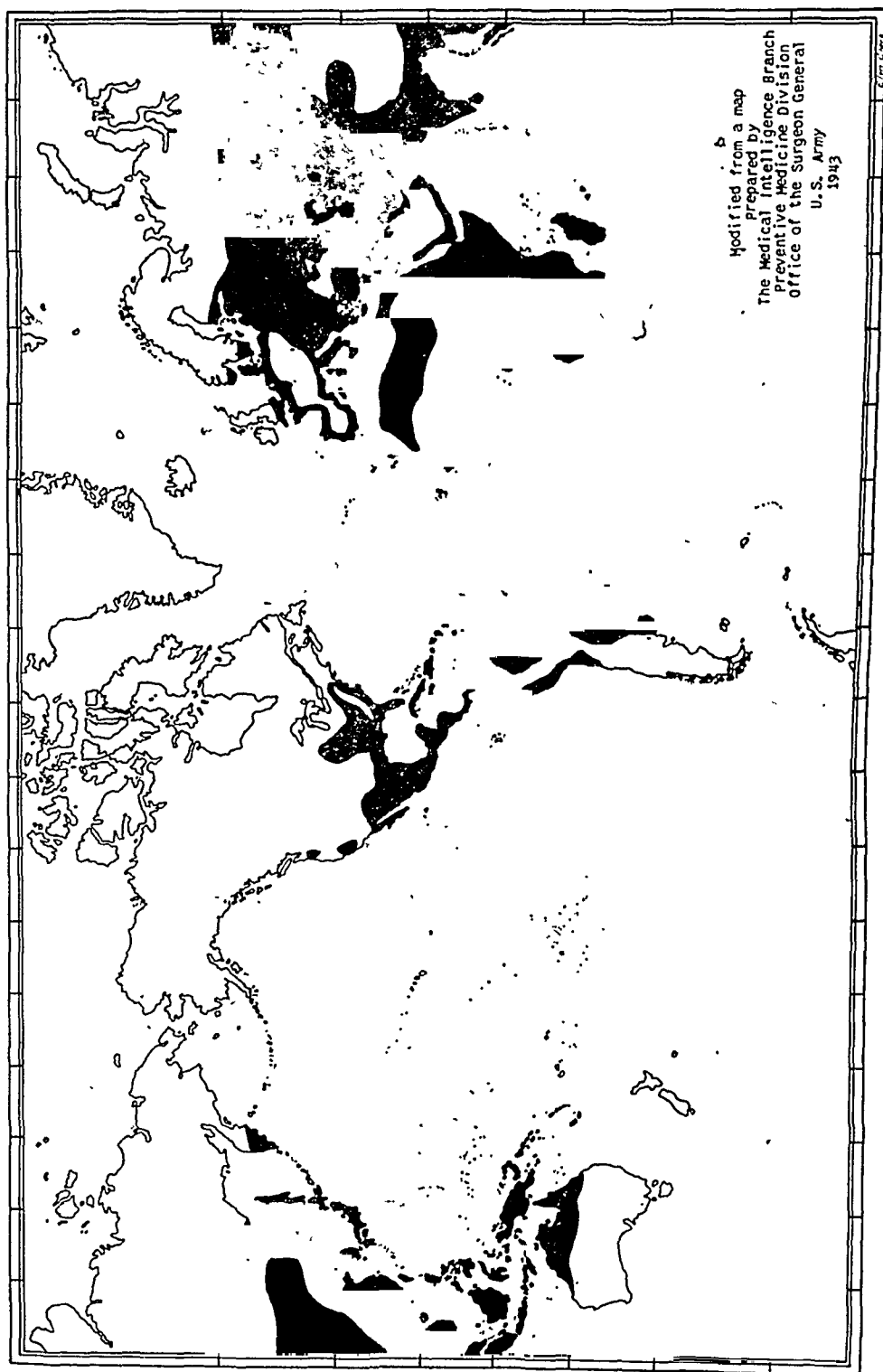


FIGURE 1—World Distribution of Malaria. Adapted from an official War Department map. (See reference.<sup>9</sup>) The original showed degrees of endemicity which have been suppressed in this simplified adaptation. Compare with Figure 2. The epidemiological data shown in this map are not to be regarded as necessarily representing the most recent or most accurate information available.

For *world* maps intended to depict the size of areas in which a disease prevails, the Mercator projection should be supplanted by projections exhibiting the "equal-area" property. In maps of this kind, if any number of pennies is spread out over various parts of the map, the territory covered by each penny will be exactly equal in area to the territory covered by any other penny. If on a map of this type one were to depict the malarious areas of the world, each area would be represented in exact proportion to its size. Hence the areal extent of the disease in any two countries could be compared by inspection of the map. Such comparisons would be misleading if attempted on a Mercator map. Mollweide's projection,<sup>5, 8</sup> the sinusoidal projection,<sup>6</sup> and Goode's homolosine projection<sup>7</sup> all possess the equal-area property. Equal-area maps have been used by certain European students of epidemiology<sup>8</sup> but have been largely neglected by American workers in this field.

The usefulness of equal-area projections in tropical medicine is revealed by a comparison of Figure 1 and Figure 2, which depict the malarious regions of the world.\* Figure 1 was drawn on the Mercator projection and is adapted from an official American map<sup>9</sup> (this map as originally published indicated various degrees of endemicity which are suppressed in this reproduction). In Figure 2 the same data were plotted on Goode's homolosine projection,<sup>10</sup> which has the equal-area property. It will be observed that in Figure 2 the non-malarious frigid zones are reduced to their correct proportions. As a corollary the regions nearer the equator, also shown in correct proportion, appear

larger than in Figure 1. Consequently the malarious regions of the world are shown to be much larger than is apparent from Figure 1. The discrepancy is even more striking when the malaria zone of North America is compared on the two maps.

The azimuthal equidistant projection is another cartographic tool which should be added to the physician's kit. As far as can be ascertained from a survey of the literature, this useful projection has never before been used for maps of the distribution of disease.

The azimuthal equidistant projection shows the *distance* between one focal point and all other points on the earth's surface. This projection is suitable for world maps of diseases which have a relatively small and continuous or nearly continuous realm of distribution. Examples of such diseases are cholera, scrub typhus (tsutsugamushi), Russian spring-summer encephalitis, filariasis caused by *Wuchereria malayi*, and fièvre boutonneuse. In diseases such as cholera, which tend to spread from a more or less well defined focus, the azimuthal equidistant projection makes it possible to emphasize the important factor of distance. For the technical details of construction the reader is referred to the standard treatises of Deetz and Adams,<sup>11</sup> Raisz,<sup>12</sup> and Herz.<sup>13</sup>

In the application of this projection certain principles must be observed. (1) Every map drawn on this projection is centered on a definite point, usually a city. A map centered on Tokio should not be used for a disease which emanates from Berlin. (2) Distances are correct between the point on which the map is centered and every other point on the map. The distance between two points neither of which is the central point of the map cannot be read off directly. (3) Maps drawn on the azimuthal equidistant projection do not possess the equal-area property.

\* The maps used in the present paper are intended merely as illustrations of cartographic methods. The epidemiological data given in these maps are NOT to be regarded as necessarily representing the most recent or most accurate information available.

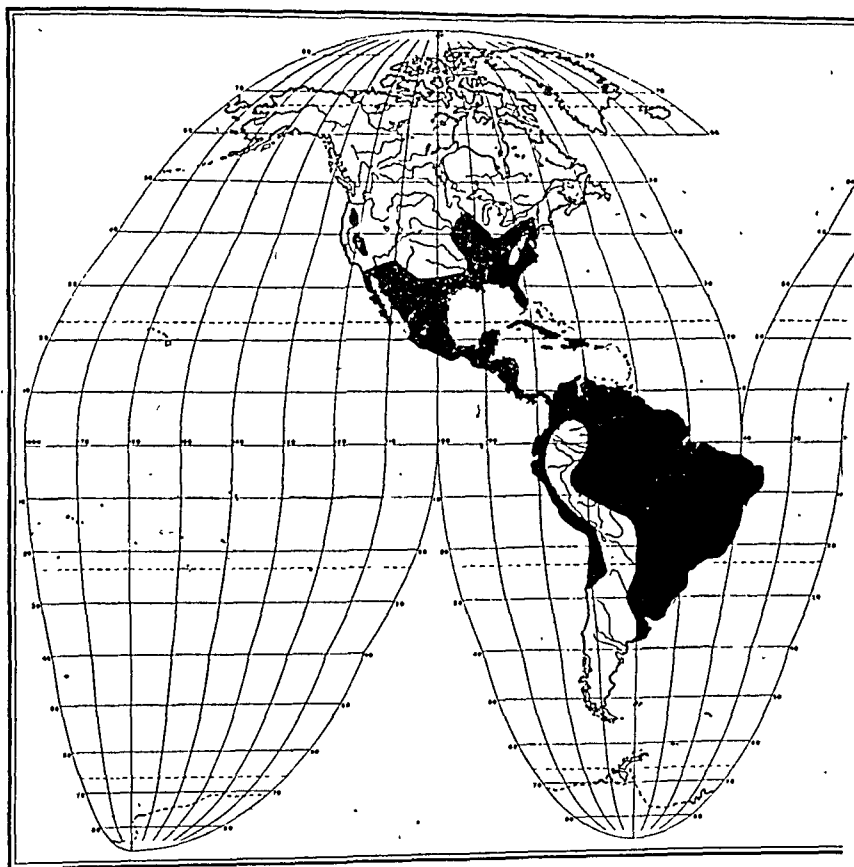
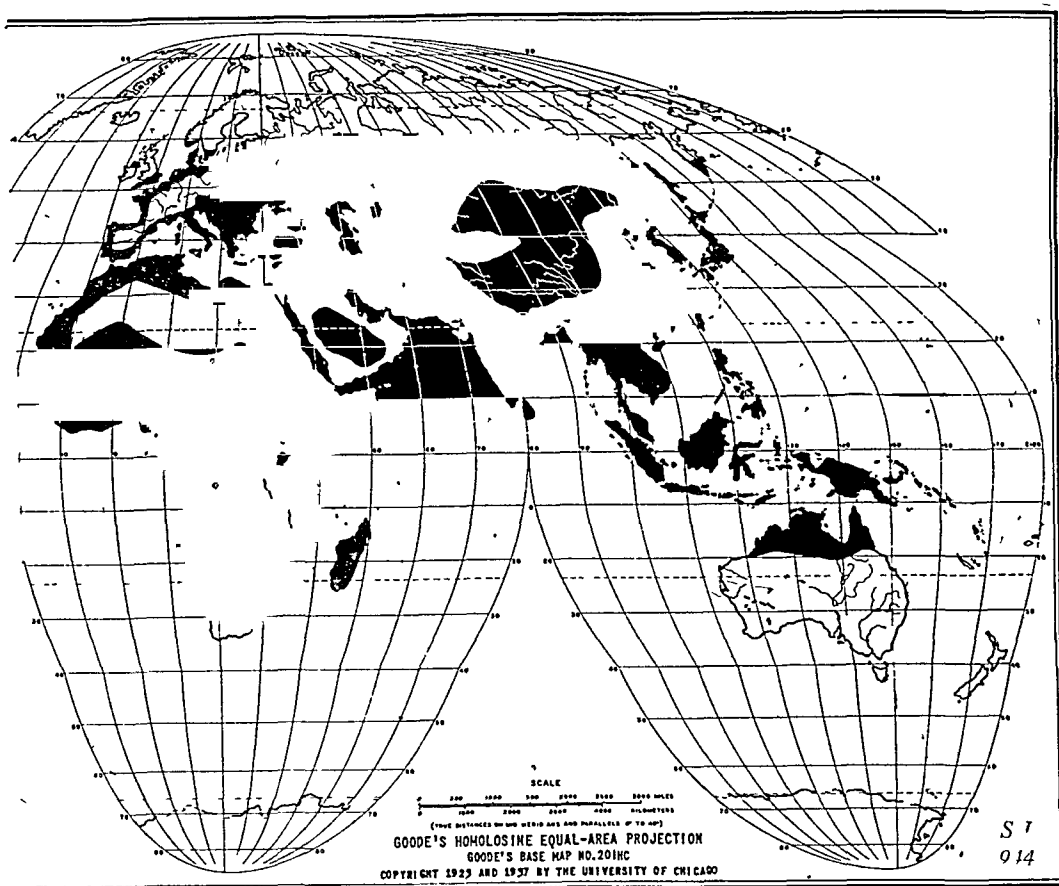


FIGURE 2—Malaria. Goode's homolosine projection. Base map by courtesy of University of Chicago. The frigid zones are reduced to their correct proportions. In consequence the equatorial zones appear larger than

In Figure 3 the distribution of cholera is shown on a map drawn on the azimuthal equidistant projection centered on the equator at  $80^{\circ}$  east longitude. This point was selected arbitrarily, chiefly for convenience, as the center point. With equal or greater propriety, the city of Calcutta ( $22^{\circ} 34' N.$ ,  $88^{\circ} 24' E.$ ) might have been assumed to be the center of the cholera regions of the world. Figure 3 emphasizes the factor of proximity in the spread of the disease. It should be studied in comparison with Figure 4, which is adapted from an official United States Army map<sup>14</sup> drawn on Mercator's projection.

Figure 3 shows that all the cholera

areas in the world can be included in a circle which has a radius of 4,000 miles. A circle having a radius of only 3,000 miles encompasses almost all the cholera areas, including those adjacent to the Persian Gulf and in Celebes. The distribution of cholera is thus relatively compact as compared with the world distribution of such diseases as malaria and dengue. It will be observed that the aforementioned 3,000 mile circle includes much more water than land. It is further noteworthy that the cholera-free regions at the northern limit of this circle are in and beyond the Himalaya Mountains. Thus it is apparent that two of the chief barriers to the extension of



in Figure 1. Hence the malarious regions of the world, here shown in true proportion, appear larger than in Figure 1. *The epidemiological data shown in this map are not to be regarded as necessarily representing the most recent or most accurate information available.*

cholera are the ocean and the mountains.

Since cholera at the present time is limited to one hemisphere, in the preparation of Figure 3 it was deemed unnecessary to represent the entire world on the chart.

For the depiction of yellow fever, which is a disease of continents bordering on the south Atlantic Ocean, one may employ a complete world map drawn on the azimuthal equidistant projection centered on Ascension Island (Figure 5). In the same way, a map of the distribution of scrub typhus (*tsutsugamushi*) could be centered arbitrarily on Singapore, and a map of the famous outbreak of dengue which occurred in 1926 could be centered on

Athens. The azimuthal equidistant projection also could be used to depict the spread or threatened spread of species of plants or animals. It likewise could be used by an anthropologist who wished to show the dissemination of a culture or process. Like any other projection—including the Mercator—it must be used with exact awareness of its properties and limitations.

#### SUMMARY

1. The Mercator projection, although of broad general usefulness, is not generally suitable for world maps of disease. It is especially unsuitable for world maps of tropical diseases.

2. Equal-area projections such as Goode's homolosine projection are in general greatly superior to the Mercator for world maps of disease.

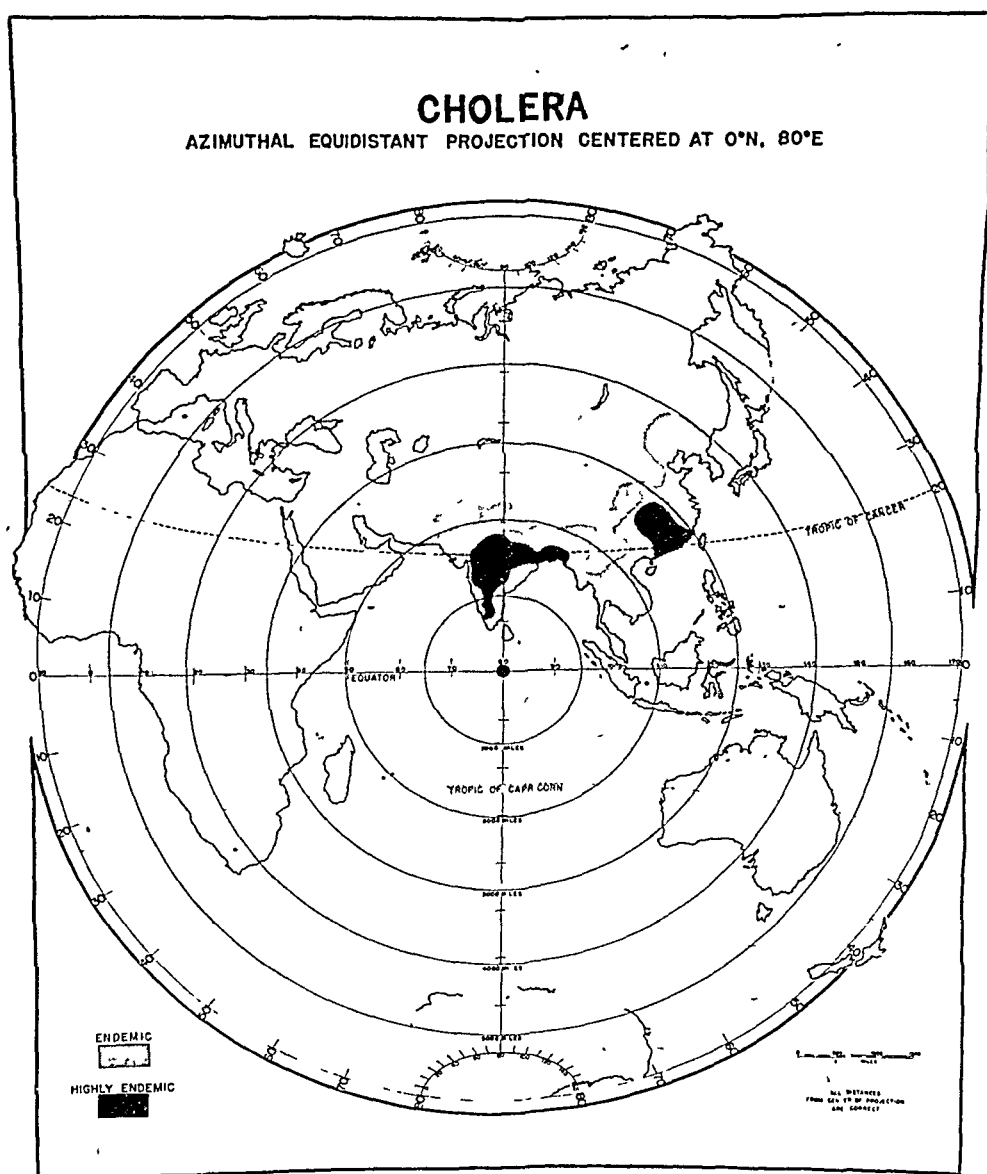


FIGURE 3—Cholera. Azimuthal equidistant projection centered on the equator at 80° east longitude. Compare with Figure 4. *The epidemiological data shown in this map are not to be regarded as necessarily representing the most recent or most accurate information available.*

3. For diseases which have a relatively restricted or coherent distribution, an appropriately centered map drawn on the azimuthal equidistant projection provides illuminating insight into the important aspects of distance and proximity.

4. The text is accompanied by five maps. *The reader is cautioned that these maps are intended merely as illustrations of carto-*

*graphic method. The epidemiological data given in these maps are not to be regarded as necessarily representing the most recent or most accurate information available.*

#### REFERENCES

1. Stewart, J. Q. The Use and Abuse of Map Projections. *Geographical Review*, 33:589-604, 1943.
2. Raisz, E. *General Cartography*. New York: McGraw-Hill, 1938, pp 81-92.

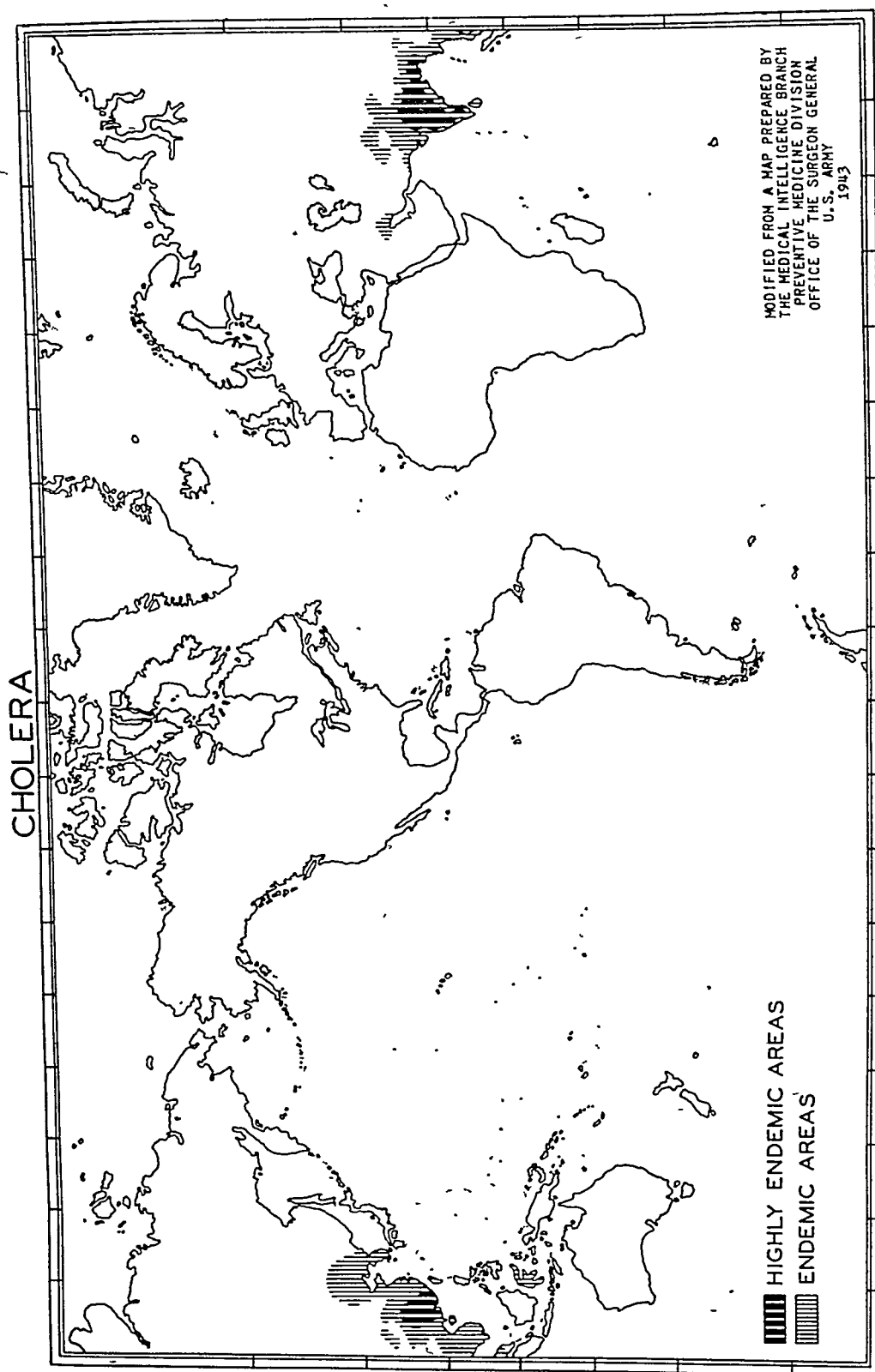


FIGURE 4—Cholera. Mercator projection. Modified from an official United States Army map. (See reference <sup>14</sup>) This map contains the same data as Figure 3. The epidemiological data shown in this map are not to be regarded as necessarily representing the most recent or most accurate information available.



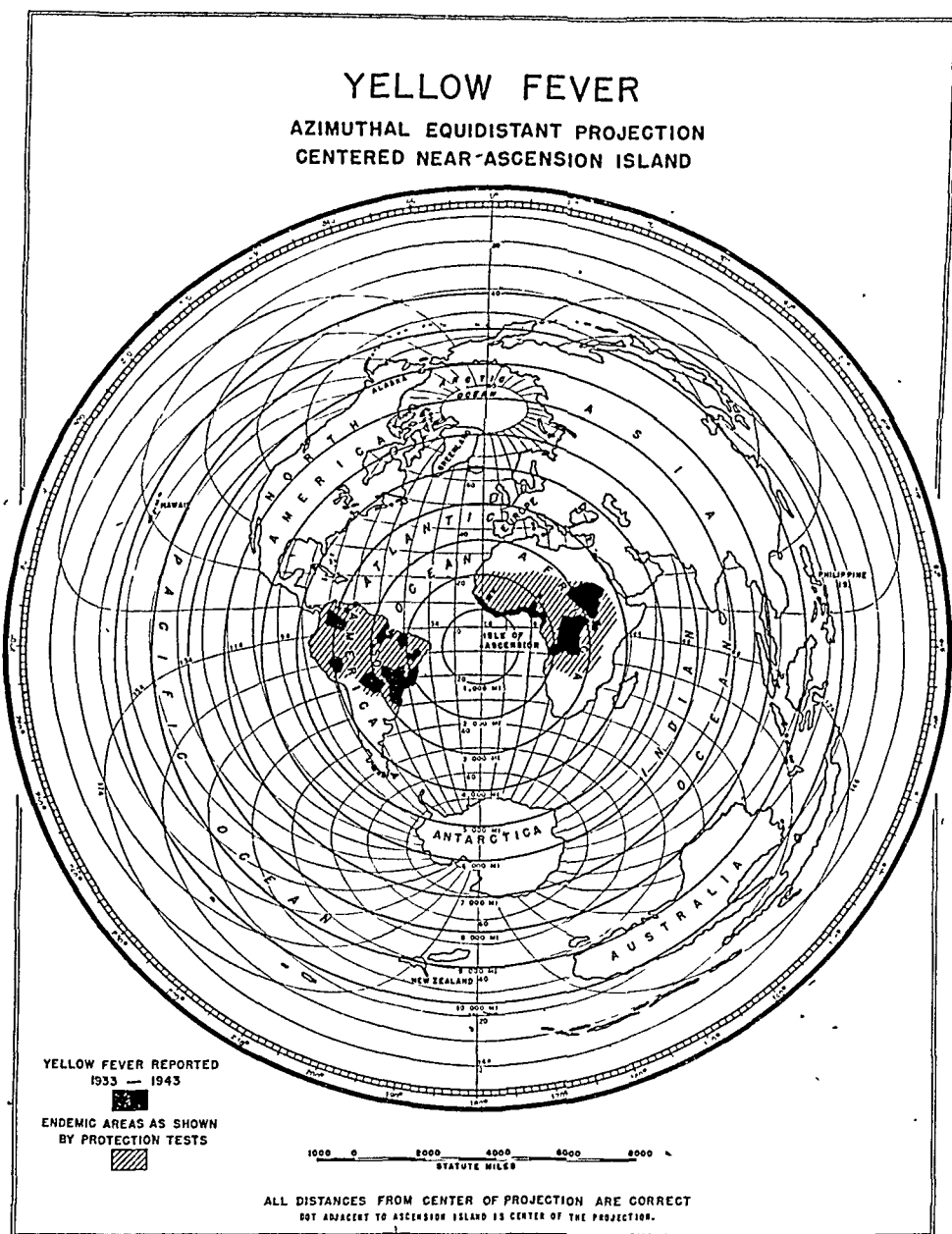


FIGURE 5—Yellow Fever. Azimuthal equidistant projection centered on Ascension Island. This map emphasizes the fact that yellow fever is a disease of continents bordering on the south Atlantic Ocean. It also shows the true distances of all other territories. Data replotted from official U. S. Army map on Mercator projection.

3. Deetz, C. H., and Adams, O. S. Elements of Map Projection with Applications to Map and Chart Construction. U. S. Department of Commerce, Coast and Geodetic Survey, *Special Publication No. 68*. 4th ed., rev. Washington, U. S. Gov. Ptg. Off., 1938.

4. Eckert, M. *Die Kartenwissenschaft*. Berlin and Leipzig. De Gruyter, 1921-1925. 2 vols.

5. Mollweide. Ueber die vom Prof. Schmidt in Giessen in der zweyten Abtheilung seines Handbuchs der Naturlehre S. 595 angegebene Projektion der Halbkugelfläche. *Zachs Monatliche Correspondenz zur Beforderung der Erd- und Himmels- Kunde*, vol. 12, no. 13, pp. 152-163, August, 1805.

(In this article the author's name is not given on the title-page. The authorship is disclosed in the table of contents on page 196 of the bound volume.)

6. Deetz, C. H., and Adams, O. S. *Op. cit.*<sup>3</sup> pp. 161-162.

7. Goode, J. P. *Goode's School Atlas*. Revised and Enlarged. New York: Rand McNally, 1943.

8. Wütschke, P. *Geographische Verbreitung von*

*Krankheiten*. Petermanns Mitteilungen, 67:53-57, 1921.

9. Geographical Distribution of Certain Diseases. *War Department Pamphlet No. 8-6*. Washington: U. S. Gov. Ptg. Off., 1943. p. 6.

10. The Outline map for this illustration is No. 201 HC in *Goode's Series of Base Maps*. For permission to use this outline the author is indebted to the University of Chicago.

11. Deetz, C. H., and Adams, O. S. *Op. cit.*<sup>3</sup> pp. 163-164.

12. Raisz, E. *Op. cit.*<sup>2</sup> pp. 109-111.

13. Herz, N. *Lehrbuch der Landkartenprojektioncn*. Leipzig, 1885. p. 96 ff.

14. Geographical Distribution of Certain Diseases. *War Department Pamphlet No. 8-6*. Washington: U. S. Gov. Ptg. Off., 1943, p. 1. See also Simmons, J. S., Whayne, T., Anderson, G., and Horack, H. *Global Epidemiology*. A Geography of Disease and Sanitation. Philadelphia: Lippincott, 1944. Vol. 1, p. 471.

## Status of Medical Facilities in the Philippine Islands

A communication from the Philippines reports the destruction by recent action of the Medical School and Library, the Cancer Hospital and the Outpatient Buildings at the University of the Philippines. All of the clinical records of the Philippine General Hospital, Manila, were destroyed and only a few broken test tubes and specimen jars were left in the laboratory.

Members of the staff who have survived the Japanese occupation are devoting their full time to the treatment of any and all who are sick and cannot

be treated at home. There is a shortage of everything and many diagnoses are made on physical findings alone. Serologic tests are made by one of the Army laboratories. Limited blood counts are done in the hospital but bacteriologic studies are not possible at present, it was stated. There is a great need for books and periodicals for the medical school and hospital and the library. The communication credited the great skill of the Filipino physicians in the present emergency.

# Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy<sup>\*†</sup>

WILLIAM J. DARBY, M.D., PH.D., AND  
D. F. MILAM, M.D., F.A.P.H.A.

*North Carolina State Board of Health, Chapel Hill, N. C.; and International Health Division, The Rockefeller Foundation, New York, N. Y.*

THE statement that 30 per cent or more of the population of our country are malnourished rests primarily upon the results of dietary surveys,<sup>1-4</sup> the most extensive of which (1) was carried out under the economic conditions existing in 1934-1937. That the standards chosen for evaluation of such data markedly affect these conclusions is demonstrated by McHenry and coworkers.<sup>5</sup> Data showing the prevalence of certain biomicroscopic changes have also been interpreted to indicate an appalling incidence of sub-nutrition within certain groups.<sup>6-8</sup> Continuous nutrition surveys of the rural population of North Carolina<sup>9-11</sup> have indicated that the dietary intake of this population is not greatly different from that of many other groups which have been investigated.<sup>6, 12-15</sup> It seems pertinent, therefore, to report the prevalence of early physical signs of malnutrition as they appear in such a population. This paper is a summary of the physical findings which were observed during a nutrition survey of a

representative sample of the rural population of Alamance County, North Carolina, during the 12 months, July, 1943, to June, 1944. An effort is made to evaluate the validity of such signs as an index to nutritional status.

The sample consisted of 959 individuals from 160 white and 39 colored rural families, selected as representative of this area. Details of the selection of the sample are reported in another communication.<sup>11</sup>

The survey methods were those which have been previously outlined.<sup>9, 10</sup> They included a medical history, a physical examination, a series of laboratory determinations on a blood specimen, and the recording of an individual 7 day food intake from which the average daily intake of the various nutrients was calculated by use of food tables. The laboratory procedures included the determination of plasma ascorbic acid,<sup>16</sup> plasma vitamin A and carotene,<sup>17</sup> erythrocyte counts, hemoglobin,<sup>18</sup> and total plasma protein and plasma albumin. The latter two determinations were carried out on approximately 50 per cent of the subjects, using a semi-micro Kjeldahl technique.

During the physical examination especial attention was directed to those signs which have been considered indicative of malnutrition,<sup>19, 20</sup> including: vascularization of the cornea, circum-

<sup>\*</sup> Based on a paper presented before the Epidemiology Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

<sup>†</sup> The studies and observations on which this paper is based were carried out as a cooperative project by the North Carolina State Board of Health, Duke University School of Medicine, and the International Health Division of The Rockefeller Foundation.

corneal injection, angular fissures of the mouth, tongue changes, alterations of the buccal mucosa, and skin changes, attributable to riboflavin deficiency; skin and conjunctival changes, attributable to vitamin A deficiency; gingivitis, to ascorbic acid inadequacy; neurologic alterations, to thiamin deficiency; gross tongue and skin changes, to niacin inadequacy, and minimal edema, to low protein dietary.

#### RESULTS AND DISCUSSION

*Weight*—Height-weight-age comparisons were made with standard tables.<sup>21</sup> Children under 15 years of age whose weights deviated from these standards by  $\pm 10$  lb. and adults whose weights deviated from them by  $\pm 20$  lb. were considered overweight or underweight. If it is assumed that these variations in weight are primarily due to a caloric excess in the case of the obese or to a caloric deficit in the underweight group, then some 29 per cent of 739 white individuals and 24 per cent of 205 colored persons were malnourished from a standpoint of calories. These incidences are given in Table 1.

the total adult population, but which has been too generally ignored.

*Nutritional Edema*—Clinical evidence of protein deficiency rests upon the presence of an otherwise unexplained edema or a lowered plasma albumin concentration. No cases of marked edema were encountered in this survey. Of the 29 cases of minimal edema of the lower extremity which were observed in the examination of 748 white subjects, only 2 women had an edema which was not readily correlated with some other clinical condition, such as varicosities, hypertension, pregnancy, or history of thrombophlebitis. These 2 women had plasma albumin concentrations of 4.0 and 3.7 gm. per cent. Eleven of 376 plasma albumin concentrations were less than 4.0 gm. per cent. Eight of these were unassociated with edema. The lowest level encountered, 3.4 gm. per cent, was well above that which Moore and van Slyke<sup>26</sup> found associated with clinical edema. No protein deficiency edema was detected in the colored group. Only 3 of the 142 d terminations on non-pregnant colored

TABLE 1

*Percentage Incidence of Underweight or Overweight Individuals in a Representative Sample of the Rural Population of Alamance County, North Carolina*

Age	White			Colored		
	Underweight Per cent	Overweight Per cent	Total Number Examined	Underweight Per cent	Overweight Per cent	Total Number Examined
Under 15 years	14.3	4.3	350	11	6	107
Over 15 years	22.3	16.4	389	12	19	98
Total	18.4	10.7	739	12	12	205

Particular attention is directed to the high incidence of obesity among the adults. This was greater in the women. The association of obesity with increased death rates has been generally recognized,<sup>22-25</sup> and it can no longer be doubted that obesity is due to an excess caloric intake. It would appear, therefore, that here is a common unquestioned form of malnutrition occurring in some 15 to 20 per cent of

individuals were below 4.0 gm. per cent. It is concluded, therefore, that clinical protein deficiency was not found in this survey and is probably of no significance in this region.

It is true that the 8 pregnant women upon whom plasma albumin determinations were made had values ranging from 3.4 to 3.8 gm. per cent with correspondingly low total proteins. Three of the women had edema. There is

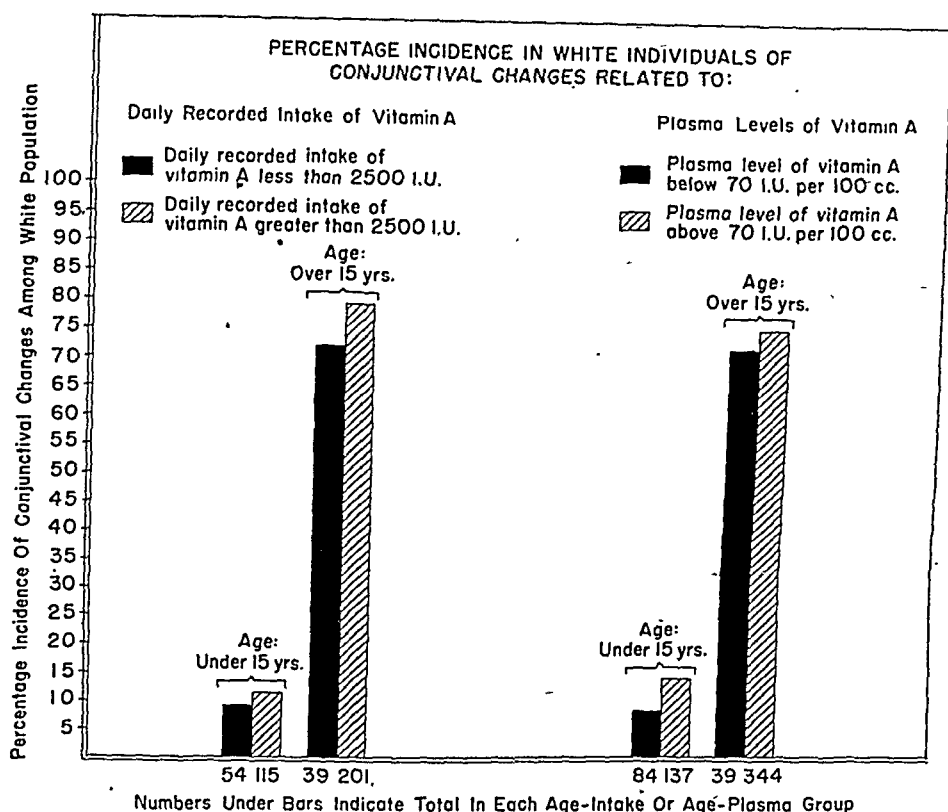


FIGURE I

insufficient evidence, however, to assign these findings to a nutritional basis.

**Anemia**—Hemoglobin values below 12.0 gm. per 100-ml. occurred in 18.5 per cent of the 244 white children and 60 per cent of the 86 colored children examined. Hookworm and malaria are not prevalent in this area, and stool examinations on a number of the children revealed no parasitic infestation. Iron intake records do not assist in interpreting these lower values. Some further evaluation of the normal limits of hemoglobin for children of the two races is badly needed.

Of 49 white women who exhibited hemoglobin values below 12.0 gm. per cent, 21 had a history of recent excessive blood loss, concurrent pregnancy, or some pertinent coexisting disease. This leaves 12.4 per cent of 226 adult white women with hemoglobin concen-

tration below this arbitrary level, which might possibly be attributed to a nutritional cause. Similarly, 12 of 57 colored women (21 per cent) had unexplained low hemoglobin values. The influence of numerous other factors would have to be ruled out, however, before one could definitely assign all of these to dietary deficiencies. Only 2 of the 200 adult males examined had unexplained values below 12.0 gm. per cent.

**Eye Signs**—The corneas and conjunctivas of each individual were examined grossly and with a slit lamp. Approximately 10 per cent of the white children and 75 per cent of the white adults exhibited conjunctival changes which have been attributed to vitamin A deficiency.<sup>6</sup> Similar incidences were noted in the corresponding colored groups. From an examination of

Figure 1, however, it is obvious that these changes did not occur more frequently in the persons with either a low recorded intake of vitamin A or with low plasma values of the vitamin than they do in corresponding groups with higher intakes or plasma levels. Such changes, therefore, are not indicative of vitamin A deficiency in this population. These findings are in keeping with the high dietary intake of vitamin A by this population, which has a mean intake approximating or exceeding that of the Recommended Dietary Allowances for this factor.<sup>11</sup>

Corneal invasion, interpreted by some as specific evidence of riboflavin deficiency<sup>45</sup> occurred in 4 per cent of 645 white persons observed. Only 1 colored person with minimal invasion was found in the group of 174 observed. This difference in the two races

has been previously noted.<sup>27, 28, 10</sup> It is particularly striking because the mean riboflavin intake of the colored group was generally slightly less than that of the white group. The presence of dilated vessels or of a large number of loops within the corneal limbus has been attributed by some to a deficiency of riboflavin. These signs, too, were less frequently seen in the colored population. Thus, 76 per cent of the white adults observed had such vessels, as contrasted with 54 per cent of the corresponding colored group.

In Figure 2 the white group is divided into two populations: one with daily recorded riboflavin intakes less than 1.35 mg. and the other with daily recorded intakes above this figure. The percentage incidences of corneal vascularization or of prominent limbic vessels is indicated by the height of the

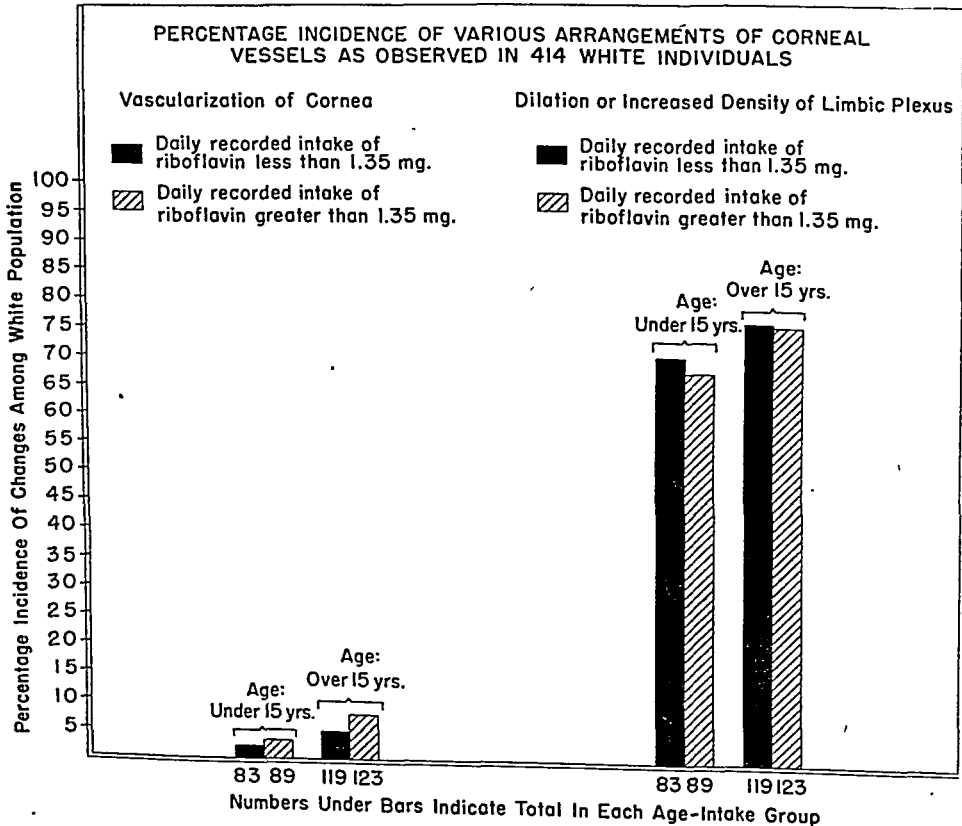


FIGURE II

bars. It is obvious that neither of the corneal signs was met more frequently in the low intake group. A limited number of the individuals with definite corneal vascularization were treated with 15 mg. of riboflavin daily and observed for periods up to 8 weeks. In no case did the vessels empty. Such evidence would indicate that these changes are not a reliable index of riboflavin deficiency in this region. The specificity of gross and biomicroscopic changes in the eye has frequently been questioned or denied.<sup>10, 27-38</sup>

*Angular Fissures*—Twenty-five of 748 white persons examined (3.3 per cent) had fissures at the angles of the mouth or scars probably indicative of recent lesions. In all but 4 of these the fissures were directly attributable to recent trauma, adentia, malfitting dentures, or anemia. Of these 4, only 1 had a recorded intake of less than 0.7 mg. of riboflavin. Only 1 colored individual of the 211 examined presented an angular fissure. This man had no other evidence of riboflavin deficiency, in fact, he had a recorded average daily intake of 1.9 mg. of riboflavin. Other signs which might suggest niacin deficiency were seen in none of the subjects with fissures.

*Tongue Changes*—Tongue changes similar to those occurring in ariboflavinosis<sup>39</sup> were found in only 3 individuals, all white adults. Two of these had a definite anemia. The recorded riboflavin intakes ranged from 1.1 mg. to 3.3 mg. per day.

*Buccal Mucosa*—Asymptomatic changes in the buccal mucosa characterized by edema, desquamation, and the presence of plaques have been suggested as of value in diagnosing riboflavin deficiency in white persons.<sup>40</sup> Sixteen per cent of the adults and 2.2 per cent of the children had mucosal changes similar to those described. The mean recorded daily riboflavin intakes for these groups were: children,

1.0 mg., adult males, 1.9 mg., adult females, 1.3 mg. Such intakes are of the order of magnitude of the means obtained for comparable groups throughout the survey.

*Evidence of Pellagra*—Only 1 case of pellagra has been reported from Alamance County within the past 5 years.<sup>41</sup> No cases were seen during the survey. Discussions with physicians in the county verified the belief that pellagra was essentially nonexistent there. Four of the white subjects gave a history compatible with pellagra in the past; the most recent such illness had occurred in 1934. Two of these individuals had lost the vibratory sense over the sock region, one had slightly pink, atrophic skin over the dorsum of the hands.

Biomicroscopic examination of the tongue was not carried out. Any tongue which appeared abnormal on careful gross examination was scrutinized with a hand lens. No cases of the scarlet-red tongue of niacin deficiency were seen. Twenty-nine of the 748 white persons and 32 of the 211 colored persons examined had hypertrophied fungiform papillae or questionable flattening of the filiform papillae. The significance of these findings is difficult to evaluate, for none of the subjects presented other physical evidence of specific deficiencies. The many extra-nutritional causes of such changes—local irritation due to carious teeth, ill-made denture, smoking, the recent drinking of hot beverages, and the like—must have contributed materially to this percentage.

*Neurologic Changes*—No advanced cases of peripheral neuritis were encountered. It has been found that symmetrical loss over the lower extremities of vibratory sensation to the frequency 256 is the earliest detectable sign of thiamin deficiency.<sup>42</sup> This sign was considered as a screen in analyzing the records. Analysis of the data is

limited to persons below 50 years of age because alteration in vibratory sensation of varied origin is frequent in individuals over 50 years of age. No alteration of vibratory sensation was noted in the children of either race. Ten (5 males and 5 females) of 306 white adults under 50 years of age exhibited loss of vibratory sensation in the toes or sock region. None of these presented any other neurological signs; 1 had a past history of pellagra, another was on a "bland diet" supplemented with "vitamin pills." The calculated daily thiamin intakes for the group ranged from 0.7 to 1.7 mg., with a mean of 1.1 mg. Of 85 colored adults under 50 years of age vibratory sensation was absent in 3. One of these was on a diet for peptic ulcer. No other neurological findings of significance nutritionally appeared within this group.

If the assumption were made that all of the above mentioned abnormalities were evidence of thiamin deficiency, the maximum incidence would be placed at 3.3 per cent of the adult population, or at 1.5 per cent of the total population. It is probable that the true incidence is considerably less than either of these figures.

Other signs of B-complex deficiency, such as skin changes and circumcorneal injection, were equally uninforming in an effort to obtain evidence of the prevalence of deficiency states.

*Gingivitis*—No cases of the livid, bleeding gums of scurvy were seen. Grossly visible swelling of the gingival margin, increased redness, or the appearance of exudate upon pressure was termed gingivitis. Fifty (14 per cent) of 357 white children and 5 (4.5 per cent) of 111 colored children had some degree of gingivitis. Two hundred (51 per cent) of 391 white adults and 54 of 100 colored adults were affected.

The survey population was divided into two groups for comparison—one with plasma vitamin C values less than

0.3 mg. per 100 ml. and the other with values above 0.3 mg. per 100 ml. Twenty-seven per cent of the white population and 31 per cent of the colored fell into the group with the lower levels. The difference in incidence of gingivitis between the groups within the two ranges of plasma ascorbic acid levels approached statistical significance in but two of the eight age-sex-color divisions. In fact, a slightly higher incidence of gingivitis occurred in three of the colored high plasma ascorbic acid groups. It is unlikely, therefore, that the marginal gingivitis here observed is due to the low plasma ascorbic acid levels. One gains the impression from the physical examinations that it is more probably attributable merely to poor oral hygiene.

*Skin Changes of Vitamin A Deficiency*—No cases of phrynoderma with or without xerophthalmia were seen. Among 748 white individuals examined the incidences of skin conditions which resembled those of vitamin A deficiency were: simple xerosis, 0.67 per cent; keratosis pilaris, 3.7 per cent; acneform lesions, 1.47 per cent. The corresponding incidences among the 211 colored were 2.8 per cent, 10.9 per cent, and 1.4 per cent, respectively. The means of the plasma vitamin A levels of none of these groups were lower than those of the means for the corresponding ages and sex within the survey as a whole. Furthermore, the mean recorded daily intake of vitamin A within these groups was equal to or higher than the means of the corresponding groups which did not show such signs. Many of the intakes were greater than the Recommended Dietary Allowances. Massive vitamin A therapy on a few of these individuals did not bring about any improvement. It appears that these skin conditions were not due to vitamin A deficiency and that the incidence of such skin changes is not an index of the vitamin A status of a



population at the nutritional level of that with which this survey deals.

**Rickets**—No x-ray or phosphatase studies were made. Two cases of active rickets were diagnosed in colored children on the basis of clinical findings. Three white children had bone deformities which might have been rachitic in origin.

**Goiter**—Six enlarged thyroid glands were noted among 391 white adults, 5 of which were in women. Three additional white women had undergone thyroidectomy. Seven enlarged thyroids with no histories of thyroidectomies were found among 100 colored adults. Six of these were in women. No goiters were observed in children of either race.

**Fluorosis**—One white and 1 colored person exhibited mottled enamel.

#### CONCLUSIONS AND SUMMARY

1. A representative sample of the total rural population of Alamance County, North Carolina, has been examined for manifestations of dietary deficiency states.

2. Physical examination and accessory clinical data indicate that in this area the most prevalent definite abnormalities attributable to malnutrition are underweight, obesity, and low hemoglobin concentrations of the blood. The latter is most prevalent in children and women.

3. The evidence here offered does not support the thesis that any serious dietary deficiency exists in this population. This is not to say that the diets of the majority of the people are satisfactory, but that whatever advantage is to be gained by dietary improvement will be in that region which cannot be assessed by most of the present-day clinical methods.

4. In a population with the nutritional level of the one here investigated the reported signs of early deficiency states, including biomicroscopic changes in the eye, are not considered specific for malnutrition and, hence, cannot alone be used to assess the nutritional status. This is not a refutation of the value of such diagnostic signs in a group existing at a genuinely low nutritional level such as may occur in the Orient, in war-torn areas,<sup>43</sup> or in the occasional patient in the medical clinic.<sup>44</sup> It will be necessary, how-

ever, to evaluate these signs in the study of any such population to which they are applied.

#### REFERENCES

1. Stiebeling, H. K., and Phipard, E. F. Diets of Families of Employed Wage Earners and Clerical Workers in Cities. *U. S. Dept. Agri. Circ. 507* (Jan.), 1939.
2. Wilder, R. M. Mobilizing for Better Nutrition. *Proceedings of the National Nutrition Conference for Defense*, May, 1941.
3. Report of the Committee on Diagnosis and Pathology of Nutritional Deficiencies, Food and Nutrition Board. Inadequate Diets and Nutritional Deficiencies in the United States. Washington: Nat. Res. Council, *Bull.* 109, Nov., 1943.
4. Phipard, E. F. How Good Is Our National Diet? *Ann. Am. Acad. Political & Soc. Sci.*, 225:66, 1943.
5. Ferguson, H. P., Leeson, H. J., and McHenry, E. W. A Nutrition Survey in East York Township. II. The Influence of the Choice of Dietary Standards upon Interpretation of Data. *Canad. Pub. Health J.*, 35:66, 1944.
6. Kruse, H. D. Medical Evaluation of Nutritional Status. IV. The Ocular Manifestations of Avitaminosis A, with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Milbank Mem. Fund Quart.*, 19:207, 1941.
7. Kruse, H. D. The Lingual Manifestations of Aniacinosis, with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Milbank Mem. Fund Quart.*, 20:262, 1942.
8. Kruse, H. D. The Gingival Manifestations of Avitaminosis C, with Especial Consideration of the Detection of Early Changes by Biomicroscopy. *Milbank Mem. Fund Quart.*, 20:290, 1942.
9. Milam, D. F. A Nutrition Survey of a Small North Carolina Community. *A.J.P.H.*, 32:406, 1942.
10. Milam, D. F., and Anderson, R. K. Nutrition Survey of an Entire Rural County in North Carolina. *South. M. J.*, 37:597, 1944.
11. Milam, D. F., and Darby, W. J. Nutrition Survey of an Industrial Rural County, in preparation.
12. Riggs, E., Perry, H., Patterson, J. M., Leeson, J., Mosley, W., and McHenry, E. W. A Nutrition Survey in East York Township. I. Description of Survey and General Statement of Results. *Canad. Pub. Health J.*, 34:193, 1943.
13. Youmans, J. B., Patton, E. W., and Kern, R. Surveys of the Nutrition of Populations. Description of the Population, General Methods and Procedures, and the Findings in Respect to the Energy Principle (Calories) in a Rural Population in Middle Tennessee. Part 1. *A.J.P.H.*, 32:1371, 1942.
14. *Idem*. Part 2. *A.J.P.H.*, 33:58, 1943.
15. Youmans, J. B., Patton, E. White, Sutton, W. R., Kern, R., and Steinkamp, R. Surveys of the Nutrition of Populations. 3. The Vitamin A Nutrition of a Rural Population in Middle Tennessee. *A.J.P.H.*, 34:368, 1944.
16. Mindlin, R. L., and Butler, A. M. The Determination of Ascorbic Acid in Plasma. *J. Biol. Chem.*, 122:673, 1938.
17. Kimble, M. S. The Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma. *J. Lab. & Clin. Med.*, 24:1055, 1938-39.
18. *Procedure for Oxyhemoglobin, Evelyn Photoelectric Colorimeter*. Phila.: Rubicon Co.
19. Jolliffe, N., McLester, J. S., and Sherman, H. C. The Prevalence of Malnutrition. *J.A.M.A.*, 118:944, 1942.
20. Youmans, J. B., and Patton, E. White. *Nutritional Deficiencies: Diagnosis and Treatment*. Phila.: Lippincott, 1941.

21. *Food and Life, Year Book of Agriculture, 1939.* U. S. Gov. Ptg. Off., Washington, D. C., 1939, pp. 161-166.
22. Dublin, L. I., and Lotka, A. J. *Length of Life: A Study of the Life Table.* New York: Ronald Press Co., 1936, pp. 201-204.
23. Fisk, E. L., and Crawford, J. Ramser. *How to Make the Periodic Health Examination.* New York: Macmillan, 1927, pp. 343-346.
24. Newburgh, L. H. Obesity. *Arch. Int. Med.*, 70:1033, 1942.
25. Newburgh, L. H. Obesity. I. Energy Metabolism. *Physiol. Rev.*, 24:18, 1944.
26. Moore, N. S., and van Slyke, D. D. The Relationships between Plasma Specific Gravity, Plasma Protein Content, and Edema in Nephritis. *J. Clin. Investigation*, 8:337, 1929.
27. Youmans, J. B., Patton, E. W., Robinson, W. D., and Kern, R. An Analysis of Corneal Vascularization as Found in a Survey of Nutrition. *Tr. A. Am. Physicians*, 57:49, 1942.
28. Vail, D., and Ascher, K. W. Corneal-Vascularization Problems. *Am. J. Ophth.*, 26:1025, 1943.
29. Youmans, J. B., and Patton, E. W. The Laboratory Diagnosis of Nutritional Deficiencies. *Clinics*, 1:303, 1942.
30. Sandstead, H. R. Superficial Vascularization of the Cornea; Result of Riboflavin Therapy. *Pub. Health Rep.*, 57:1821, 1942.
31. Editorial. Riboflavin and Corneal Vascularization. *Brit. M. J.*, 1:545, 1943.
32. Stannus, H. S. Ariboflavinosis. *Brit. M. J.*, 1:645, 1943.
33. Fish, W. M. Acne Rosacea Keratitis and Riboflavine (Vitamin B<sub>2</sub>). *Brit. J. Ophth.*, 27:107 1943.
34. Gregory, M. K. The Ocular Criteria of Deficiency of Riboflavin. *Brit. M. J.*, 2:134, 1943.
35. Kódicek, J. H., and Yudkin, J. Slit-lamp Microscope in Nutrition Surveys. *Lancet*, 2:753, 1942.
36. Scarborough, H. Circumcorneal Injection as a Sign of Riboflavin Deficiency in Man. *Brit. M. J.*, 2:601, 1942.
37. Metivier, V. M. Bitot's Spots in Trinidad. *Am. J. Ophth.*, 24:1029, 1941.
38. Berliner, M. L. Regarding the Early Detection of Avitaminosis A by Gross or Biomicroscopic Examination of the Conjunctiva. *Am. J. Ophth.*, 25:302, 1942.
39. Kruse, H. D., Sydenstricker, V. P., Sebrell, W. H., and Cleckley, H. M. Ocular Manifestations of Ariboflavinosis. *Pub. Health Rep.*, 55:157, 1940.
40. Sandstead, H. R. Deficiency Stomatitis. *Pub. Health Rep.*, Sup. 169, 1943.
41. *Morbidity Statistics.* North Carolina State Board of Health. 1939-1943.
42. Graves, R. W. Personal Communication.
43. Adolph, W. H., Greaves, A. V., Lawney, J. C., and Robinson, H. L. Nutritional Disorders in Japanese Internment Camps. *War Med.*, 5:349, 1944.
44. Ruffin, J. M., Cayer, D., and Perlzweig, W. A. The Relationship between the Clinical Picture of a Mild or Early Vitamin Deficiency and Laboratory Determinations of Vitamin Levels. *Gastro-enterol.*, 3: 340, 1944.
45. Kruse, H. D. Medical Evaluation of Nutritional Status in *Handbook of Nutrition.* Chicago: American Medical Association, 1943.

## Best Sellers in the Book Service for September

Local Health Units for the Nation. Haven Emerson, M.D. 1945.....	\$1.25
An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945.....	1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945 .....	.35
National Health Agencies. A Survey With Especial Reference to Voluntary Associations. Harold M. Cavins. 1945.....	3.00
Voluntary Health Agencies. An Interpretive Study. Selskar M. Gunn and Philip S. Platt, Ph.D., 1945 .....	3.00
Health Instruction Yearbook, 1945. Oliver E. Byrd, Editor. 1945.....	3.00
Vital Statistics Directory. American Public Health Association. 3rd ed., 1945.....	.75
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed., 1945 .....	4.00
Administrative Medicine. Haven Emerson, M.D. 1941.....	10.50

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

# New Developments in Teacher Education

With Implications for Health Education \*

MAURICE E. TROYER, PH.D.

*Director, Bureau of School Services, Syracuse University, Syracuse, N. Y.*

THERE are many recent developments in both undergraduate and in-service teacher education, but only the briefest summary will be made of trends in undergraduate education in order to emphasize current practices in the in-service education of teachers with special reference to health education.

## SOME TRENDS IN THE PRE-SERVICE EDUCATION OF TEACHERS

1. Teachers for our times need a high degree of mental ability. They should be able to sustain a normal energy output. And they should be emotionally stable. These relatively constant factors provide the major bases for recruitment, selection, and guidance.

2. The trend in educational orientation courses is away from an overview of the history of education and the skimming of the surface in other professional courses. Increasingly, the introductory course at the freshman level is serving four purposes: (a) To acquaint students with their new educational environment; (b) to give the students the clearest possible under-

standing of the competencies required of teachers; (c) to help them analyze their strength and weaknesses with respect to those competencies; and (d) to help them plan their educational program in the light of their strength and weaknesses.

3. Where such orientation courses have been put into operation, the trend is away from highly centralized counseling services, with instructors becoming counselors to small groups of freshmen in the orientation course.

4. Changes in the organization of the general education program are away from a selection of highly specific courses toward larger area courses in science, social studies, and the humanities; with a tendency to go beyond lectures, discussions, and reading, to actual responsible participation in programs working toward the solution of community and personal problems of everyday living. Hence, learning activity moves directly toward goals, using the literature and the knowledge of the instructor as sources of help. There is also a trend toward more emphasis on the arts in general education, not only to expand the media of expression, but also to broaden the appreciations and values that make life worth while.

5. The trends in professional education are similar to those in general education. Specific courses in psy-

---

\* Based on a paper presented at a Joint Session of the American School Health Association and the Public Health Education, and the School Health Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

chology are giving way to broader study of child development. Students work with children in and outside of school; sometimes with individuals and at other times with groups. The literature in psychology, physiology, sociology, and anthropology becomes a resource as students seek to understand the children with whom they work. Responsible (responsible is used here in contrast with passive observation) work with children becomes the integrating agency by which the ideas about child development, philosophy, curriculum and methods begin to fit together so as to provide a rationale of education.

It is precisely this rationale that has been so noticeably lacking in professional education by fillets of subject matter. To be more specific, teachers whose education is predominantly oriented to the logical organization of professional subject matter are likely to be blind to the needs of children. When teachers think of their guidance function, they try to understand children. When democratic processes are uppermost in their minds, they want to work *with* children rather than *on* them. When they become concerned about the curriculum to be covered, they prescribe. And when they try to apply their knowledge of tests and measurements, they unwittingly destroy the security and violate the integrity of many of their students. The major hope for the development of rationale seems to be in a teacher education program in which students learn to use the rich resources in the literature in the fulfillment of their responsibilities with children.

6. The processes of appraising the effectiveness and progress of individual teachers and of groups should be in accord with the professed philosophy and the best that is known about the psychology of learning. Those who are attempting to be democratic in their relationships with others will appraise

progress in such a way as to preserve the integrity of the individual. Appraisal becomes something that is done with rather than to the individual. The concept of readiness becomes as important for appraisal as for learning. Appraisal tends to become a process of self-evaluation under guidance toward the end that evidence of strength and weakness is understood, accepted, and used by the evaluated.

#### SOME TRENDS IN THE IN-SERVICE EDUCATION OF TEACHERS

##### *Why In-Service Teacher Education?*

Graduates from the professional education programs of our teachers' colleges and universities are only ready to begin to teach. This casts no aspersions on undergraduate programs of teacher preparation. These programs are improving in many ways, as has just been pointed out. But at best there can be no substitute for the necessary learning required of teachers when they assume the full-time responsibilities of teaching. There is no way to anticipate fully in the pre-service program all of the obligations and responsibilities of teachers.

Perhaps we can make the complexity of their responsibility and the need for continuous teacher education more explicit. The education of a doctor is among the most comprehensive and extensive in the professions, but presupposes that his education will continue throughout his life. But many of the problems which teachers face in their everyday responsibilities are more complex and nebulous than those faced by the doctor. The physiological, sociological, and psychological forces that combine to "make Sammy run" call for understandings and skills that are among the most complex demanded of human beings. Why is Mary a scholastic wizard and rejected by her classmates? Why is John so interested in math, so utterly disinterested in other

courses, in conflict with most of his teachers, and so careless in social conduct? How can individual and group needs be identified accurately and how can these needs be served without sacrificing the individual for the group or vice versa? How can motivation generated out of real interest be developed to supplant the highly artificial motivation characteristic in so much of our educational program? The answers to these questions do not come easily, but until such questions as these can be answered by teachers, their education is not complete. This is what is meant by the need for a continuous program of in-service teacher education in our schools.

Many teachers have resented in-service educational efforts. Experience in the Cooperative Study of Teacher Education\* showed, however, that teachers do not object so much to continued study as to more of the same. Many teachers who resist taking more courses desire help on the problems they face in their everyday teaching responsibilities. In reversing a traditional procedure, providing resources to teachers when and where their problems are—in their schools and communities—in contrast to demanding that they go to resources at a college or university where their work is predominantly on problems outlined by their professors, teachers are finding satisfaction.

*What are the procedures and conditions conducive to continuous teacher education?*

The Coöperative Study in Teacher Education, sponsored by the American Council on Education, 1938-1943, gave considerable attention to this question.\*

Four conclusions of this study will be set forth and illustrated in the following pages.

1. *Those schools made most progress where there was a conscious and studied effort by the faculty to become more democratic in their relationships.* Democracy is not something one gets by sudden conversion. Democratic ways of doing are learned. The most democratic person imaginable still would have much to learn if he were to be consistently democratic in all his relations with others. The enthusiasm a teacher has for his work and his success in it is largely dependent upon the quality of his relationship with administrators, supervisors, fellow teachers, children, and parents. Factors which operate to disturb the security or reduce the status of either party in any of these relationships tend also to reduce the creativeness and effectiveness of teachers. A democratic and at the same time educational principle is involved. In a society that can be called democratic, there is regard for the integrity and the security of the individual. Integrity and security are gained and sustained through mutual understanding. It is the responsibility of education, whether at the teacher or pupil level, to develop those understandings. Superimposed programs or restrictions from the administrative offices tend to short-cut the education necessary to understanding and acceptance by the teacher. Furthermore, imposed programs imply a fundamental lack of faith in the integrity of the individual. This is not to say that teachers cannot profit by the mature experience of others. It is to say that the teacher worthy of his position should have something to contribute to the program that is his responsibility and to the formulation of the rules under which he operates. Teachers likewise should not demand of the administrator that which de-

\* A five year study sponsored by the American Council on Education in cooperation with 20 colleges and some 30 schools and school systems, 1938-1943. Reports are being published currently by this Council, 744 Jackson Place, Washington, D. C.

stroys the security and integrity inherent in his responsibilities.

Working relationships and procedures between administrators and teachers cannot be outlined once and for all time, and for all schools. Such outlines have been published. Problems of human relationships are complex, subtle, and difficult to understand. Ways of working together effectively on them are learned in each staff through attempts to solve the peculiar problems of the local school. The more complex problems become, the more study of them is necessary.

These relationships are described first because the emotional climate of the school plays such an important rôle in the well-being of everybody concerned and in the success of the program. But in the experience of the Coöperative Study, the improvement of personal relationships is not ordinarily to be attempted directly. Understanding of problems of human relationship is best gained through an attack on problems of the school's program, provided teachers and administrators are sensitive to the fact that all of these problems involve human relationships. For example, a committee or study group working toward the improvement of a school's health program will—as they study their curriculum, children, and community needs—sooner or later generate some ideas that have implications for existing courses in science, nutrition, physical education, and hygiene. There is a strong tendency for one of these groups to try to “scoop” the other to gain control of new developments. The first requisite is that the group be sensitive to the implications of their work for the security and integrity of others. And the second is that there be a disposition to study and keep wholesome the staff relationships.

2. *By and large, the most successful programs were those that started with*

*problems that the teachers believed important.* This conclusion may seem to be too simple to merit emphasis. There is, however, a tendency among leaders in the public schools to determine the problems on which they want teachers to work. Where study groups were organized around problems determined by others, the interest tended to lag. Many teachers felt that if they were to spend time in study, they wanted to have help on their everyday thorn-in-the-flesh. Perhaps it was getting students to want to learn, or a single child who was in constant conflict with the other children. Attacking such problems comprehensively led many teachers to intensive child study who did not join a child study group when invited to do so as the initial step.

There are, of course, many ways in which teachers' interest in important problems can be stimulated. A brief survey of school and community health can readily lead to a more comprehensive survey in which there is wide participation by teachers, health workers, and students. This participation gives real purpose to subsequently developed programs.

3. A corollary to the foregoing conclusion is this: *that teachers and administrators work together most effectively when they work on problems on which they can make progress.* The staff may identify real weaknesses in the program for which they have neither the resources nor the leadership to work successfully toward improvement. Or there may be prior considerations that need attention in a sequence of weaknesses. If these points are disregarded, discussion is likely to run in circles. The group will be unable to move from discussion to action, and the enthusiasm of the participants will soon dwindle. On the other hand, the morale of the group will thrive on success achieved by attacking problems ripe for consideration.

4. *Adequate resources in personnel and materials should be available.* One important method of providing personnel resources was to prepare staff members from within the ranks to assume special responsibilities. This was most successful wherever carefully planned. A group anticipating a problem would choose one or more of its members to study procedures used in another school that had attacked rather successfully a similar problem, or they would send them to a selected workshop or to the Collaboration Center in Child Development at the University of Chicago. When the faculty delegated the responsibility to one of their own choosing, they were expecting him to give impetus and leadership to activities on his return and were inclined to work with him.

Another method of supplying personnel resources is to bring consultants to the school. This was done for special groups and for locally organized workshops. The assumptions underlying consultant services are that a group of people vitally concerned about a problem want help on it. The work of the consultant should be well planned. Otherwise the consultant may lecture when he should be listening. He may prescribe when he should be suggesting. He may try to stimulate the group to explore the problem when the group has already done so and is ready for ideas on how to solve it.

Material resources were provided in like manner. Teachers who attended workshops or the child development center had a comprehensive accumulation of library materials at their disposal. And those who worked in the home school tended to build a professional library of curriculum materials, reference books, and tests.

*How do these controlling factors work out in practice?*

No two of the fifty-odd schools and

school systems in the Coöperative Study tackled identical problems, organized their programs in the same way, or derived the same results. Therefore the teacher education program of no one school can be considered typical. However, a brief account of the activities of the Moultrie, Ga., teachers will demonstrate how the conditions set forth above worked out in practice.

For several years before the Coöperative Study of Teacher Education began, Moultrie High School had been a participant in a study sponsored by the Southern Association of Colleges and Secondary Schools. Teachers had been clarifying their objectives and modifying their program with the help of consultants, workshops, and other resources. Curriculum revision had also been under way in the elementary school systems. A series of reports by committees representing the entire state of Georgia had thrown the spotlight on certain economic and health conditions, and the schools had accepted the challenge of these conditions. More intensive local and county-wide surveys of health and recreational needs were among the major projects. Teachers throughout the county working in coöperation with social agencies, doctors, dentists, and nurses organized programs for immunizing children against certain contagious diseases and examining them for hookworm, dental defects, and social diseases. For example, the examination showed that of 3,350 county and town pupils examined in a 7 month period, 1,570, or 47 per cent, were found to be infected with hookworm. Members of the study group then prepared and administered a factual test on the causes of hookworm to all teachers and pupils. On the first test, teachers averaged 64 per cent correct responses with a range of 4 to 88 per cent. Pupils scored slightly lower. On a second test administered after some instruction, the average teacher's score was 92 per cent, and in many classrooms the pupils made retest scores approximating the achievement of teachers.

In the meantime, programs for the treatment of hookworm were developed. It was necessary to educate parents and children to accept and support these activities. Clinics were organized, financial support secured. Follow-up studies showed that treatment was not the whole solution to the problem of hookworm infection. Reinfection occurred.

Hookworm infection and its consequences called for an educational program to improve sanitary conditions and diet. Analysis of foods served in the school cafeteria showed that they were inadequate. Observations of students' choices of foods showed poor selections. Through the combined planning of the cafeteria manager, a committee (including the nurse, homemaking and science teacher) and the N.Y.A., it was possible to provide a meal consisting of two vegetables, meat, and a drink for 10 cents. Study materials on food content and balanced diet were prepared for use in advisory or student groups. and the educational program on nutrition improved students' choice of foods.

One of the educational programs to improve sanitary conditions in the home was carried on by the agricultural department. A demonstration sanitary toilet unit was built and information was furnished concerning costs and methods of construction. No accurate record of the installations was available, but records from the County Health Office from January, 1940, to June, 1942, showed that 510 pit toilets and 104 septic tanks had been built. Other projects emphasized screening of windows and doors, laundering, and habits of personal cleanliness.

In the meantime, the health project had expanded. Working coöperatively with other professional groups, school children were immunized against certain contagious diseases and treated for dental defects and social diseases. In the progress reports submitted to the commission, June, 1942, the following recommendations were recorded.

"There no longer seems to be any reason for veiling the study of syphilis and gonorrhea by the inclusion of some other diseases. The possibility of an educational program for adults of the county should be investigated. Such a program should include the mothers and fathers of students and many others. The study of venereal diseases by pupils can best be made as phases of sex education and health education. . . . Our work has only begun. It has brought forth no unfavorable criticisms. It is the wish of the committee that this beginning may serve as a foundation for more thorough study and effort."

The key to the success of the Moultrie project seemed to be coöperation, leadership, and adequate consultative resources. There can be no doubt concerning the contribution made by doctors, dentists, and nurses to their own

education and the education of other teachers as this project progressed. Hygiene and health habits cannot be inculcated fully through the isolated efforts of the nurse or the doctor in the school any more than students can achieve adequacy in oral and written expression through the efforts of the English teacher working alone.

Recently several workshops have been organized in central and city schools of upstate New York for purposes of developing a program of health education and hygiene from the lower elementary through the secondary grades. In these workshops are elementary teachers, science teachers, physical education teachers, home economics teachers, nurses, and dental hygienists. Appropriate consultants from our School of Education, are working with the teachers in a coöperative effort to develop a program that will make sense to the student as he progresses through the educational program. The teaching nurse, dental hygienist, and doctor should have a real place in the school's program, not alone in their offices where they diagnose and administer to individual needs, but also in the group instruction, for it is they who can present the clearest and most convincing picture of conditions.

In conclusion, we have seen the necessity of opening channels to coöperative study and well intentioned democratic procedures. Professional growth comes more readily when faculty members feel secure, when they understand the importance of problems, when the resources for working on problems are adequate, and when teachers have confidence in the evidence gathered concerning the effectiveness of their efforts. These same working relationships might be adopted to good advantage by two other groups: by directors of professional divisions in our state departments, and by associations of teachers of physical



education, science, and public health. The former tend to compete with each other for dominance over programs. The latter tend to fortify their vested

interests. By so doing, both stand in the way of coöperative and full utilization of rich resources found within or available to our public schools.

---

## American Medical Association Offers Electrical Transcriptions on Public Health

W. W. Bauer, M.D., the Director of the Bureau of Health Education, American Medical Association, Chicago, has announced that the Bureau offers a new series of electrically transcribed radio programs for use by local medical societies or by local health agencies approved by such societies.

According to Dr. Bauer, the new series of health platters is entitled *Guardians of Your Health*. It consists of interviews and round table discussions featuring thirty-three public health authorities, including health officers of cities and states, laboratory directors and federal health officials. The theme of the series is medical and public health coöperation for the better health of the nation. The programs were prepared under the supervision of the Bureau of Health Education; scripts were written by Harriet Hester, who also interviewed the speakers; each program is summarized by Dr. Bauer. The titles and speakers are as follows:

1. *Doctors Guard Your Health*: Haven Emerson, M.D., New York; W. W. Bauer, M.D., Chicago.

2. *Health in Your Town*: M. R. French, M.D., Paw Paw, Mich.; Gertrude Cromwell, R.N., Des Moines, Iowa; Major Joel I. Connolly, Chicago.

3. *The Health State*: A. J. Chesley, M.D., St. Paul; Stanley Osborn, M.D., Hartford, Conn.

4. *Guarding the Nation's Borders*: Thomas Parran, M.D., Surgeon General, James P. Leake, M.D., C. C. Applewhite, M.D., U. S. Public Health Service.

5. *Health in Our Hemisphere*: John A. Ferrell, M.D., New York; Hugh S. Cumming, M.D., Pan American Sanitary Bureau.

6. *Health in the Schools*: Ruth Grout, Ph.D., Minneapolis; Charles C. Wilson, M.D., New York.

7. *Sanitation—An Unfinished Job*: H. G. Callison, M.D., South Carolina; F. C. Beelman, M.D., Kansas; Huntington Williams, M.D., Baltimore.

8. *Guarding the Food Front*: P. A. Dunbar, Ph.D., U. S. Food and Drug Administration; Willard H. Wright, M.D., U. S. Public Health Service.

9. *Trained Public Health Workers*: William P. Shepard, M.D., San Francisco; Agnes Fuller, R.N., New York.

10. *The Public Health Laboratory*: W. D. Stovall, M.D., Madison, Wis.

11. *Controlling Contagious Diseases*: Carl A. Wilzbach, M.D., Cincinnati; Thurman B. Rice, M.D., Indianapolis; Commander Dean F. Smiley, U. S. Navy.

12. *Popular Health Crusades*: Charles E. Lyght, M.D., Don W. Gudakunst, M.D., Walter F. Clarke, M.D., Philip S. Platt, Ph.D., New York.

13. *Health Education*: Donald B. Armstrong, M.D., New York; Thomas G. Hull, Ph.D., Chicago; Lester Taylor, M.D., Cleveland.

These platters are available on loan by application to the Bureau of Health Education. The series will be lent only as a whole and for broadcasting purposes only. There is no charge to the local group except payment of return shipping costs. All local broadcasting arrangements must be made by local groups. Scripts accompany platters; but material to be offered to listeners, if such offers are to be made, must be provided locally.

# North Carolina's Reportable Diseases

C. P. STEVICK, M.D.

*Director of the Division of Epidemiology, State Board of Health, Raleigh, N. C.*

THE requirement that physicians and certain other persons report the occurrence of a selected group of diseases to some designated agent is one of the more frequently misunderstood of the various activities of the present-day public health organization which directly concern the practising physician. Some physicians look upon reporting as an unnecessary burden and many who do report faithfully are not fully aware of the reasons for this requirement.

Part of the cause for this state of affairs undoubtedly lies with public health administrators who have neglected to present plausible reasons for requiring certain diseases to be reported or have not explained sufficiently often the services that become available both to the physician and the public when a report card reaches the local health department. This is an attempt, therefore, to answer the question "Why report?"

Reporting is required by state health agencies for certain communicable and non-communicable diseases commonly listed as "preventable." One of the chief causes for difficulty lies in the use of the word "preventable." Practically speaking, many of the diseases so classified cannot be prevented to any *reasonable* extent by the means now available. Even in the case of the truly preventable group the control measures available differ considerably in their degree of efficiency. Additional confusion arises if the reportable group lists non-communicable as well as communicable diseases in the same category,

since the same urgency for reporting does not always exist in the case of non-communicable diseases as in the case of those that can readily spread without the prompt institution of control measures directed either toward the individual patient or the original source of the infection.

Taking these factors into consideration, therefore, it would appear that there could be set off a group of communicable diseases that either cannot be prevented at all or for which only very inefficient means of control are available so that ordinarily it would be impractical to require their reporting. On the other hand, there would remain a group of communicable diseases for which relatively efficient control measures are available and in the case of which reporting might be a necessary step.

The reporting of non-communicable diseases is not standardized among the various states. Several require the reporting of preventable industrial diseases in addition to the various communicable diseases. North Carolina required the reporting of pellagra until recently. Since no non-communicable diseases are required to be reported at present in this state this problem will not be discussed further here.

In order to determine whether or not a communicable disease might be suitable for reporting, the following two factors should be considered:

1. The relative importance of the disease as a public health problem
2. The efficiency of the control measures available

Each of these items may be subdivided into degrees, namely, low, moderate, or high. For example, influenza, while being of moderate to great importance, has no reasonably effective control measure yet available for public use and, therefore, would rank below other diseases of approximately equal importance for which there are well developed control programs available.

In Table 1 the communicable diseases required to be reported by the various states<sup>1</sup> are classified and scored on the basis of these two factors, as determined by the status of each disease in North Carolina.

In scoring each disease according to its importance not only was the case fatality rate considered but also the "potential incidence." For example, yellow fever, a disease having a high case fatality rate, is absent from this country at present but the vector exists

widely and, should an infected person arrive from the endemic area and escape observation, a widespread outbreak could occur very easily in North Carolina and certain other states. The classification of both the importance of the disease as a public health problem and the efficiency of the control measures would vary with different geographic areas and is to a large extent arbitrary. However, in a given area any differences in scoring would probably not greatly affect the final division of the diseases as shown in Table 2, which is made on the basis of high, medium, or low score only.

Of the five groups shown in Table 2 the diseases in the low score division (Groups I and II) can be considered of minor importance to the public health program in North Carolina at present and, therefore, can be omitted from consideration in selecting the re-

TABLE 1

Low Importance = 1			Low Control Efficiency = 1				
Moderate Importance = 2			Moderate Control Efficiency = 2				
High Importance = 3			High Control Efficiency = 3				
	Importance	Control	Total		Importance	Control	Total
Disease				Disease			
Anthrax	3	3	6	Granuloma	3	2	5
Ascariasis	2	3	5	Hookworm Disease	2	3	5
Bronchitis	2	1	3	Impetigo	1	2	3
Chancroid	2	3	5	Infectious Jaun.	*		
Chicken Pox	1	1	2	Influenza	3	1	4
Cholera	3	3	6	Leprosy	3	3	6
Coccidioidomycosis	2	1	3	Lym. Choriomen.	2	1	3
Colorado Tick F.		*		Lymphopathia V.	3	2	5
Common Cold	2	1	3	Malaria	3	2	5
Conjunctivitis	1	2	3	Measles	2	2	4
Dengue	2	3	5	Mening Meningitis	3	2	5
Diarrhea		†		Mumps	1	1	2
Diphtheria	3	3	6	Paragonimiasis		†	
Dysentery, Bac.	2	2	4	Paratyphoid F.	3	3	6
Dysentery, Amebic	2	2	4	Pediculosis	1	2	3
Echinococcosis		†		Plague	3	3	6
Encephalitis	3	1	4	Pneumonia	3	1	4
Erysipelas	2	1	3	Poliomyelitis	3	1	4
Favus	1	2	3	Puerperal Sepsis	2	3	5
Filariasis		†		Pittacosis	3	3	6
Foot & Mouth Dis.	1	2	3	Rabies	3	3	6
German Measles	1	1	2	Rat Bite Fever	2	1	3
Glanders	3	2	5	Relapsing Fever	2	1	3
Gonorrhea	3	2	5	Rheumatic Fever	3	1	4
				Ringworm	1	2	3
				Rocky Mtn. S. F.	3	2	5
				Scabies	1	2	3
				Scarlet Fever	3	2	5
				Schistosomiasis		†	
				Septic Sore Throat	2	2	4
				Smallpox	3	3	6
				Sporotrichosis	2	1	3
				Syphilis	3	3	6
				Tetanus	3	2	5
				Tick Paralysis	2	1	3
				Trachoma	3	2	5
				Trichinosis	2	2	4
				Tuberculosis	3	3	6
				Tularemia	3	2	5
				Typhoid Fever	3	3	6
				Typhus Fever, End.	2	3	5
				Typhus Fever, Eur.	3	3	6
				Undulant Fever	2	3	5
				Vincent's Infec.	2	1	3
				Whooping Cough	3	3	6
				Yaws		†	
				Yellow Fever	3	3	6

\* Not sufficiently well known for classification

† Not sufficiently clear-cut as a clinical entity for classification

‡ Natural geographical distribution shows occurrence too rare in USA for consideration up to the present time

TABLE 2

*Low Score Division*

## GROUP I (score of 2):

Chicken Pox

German Measles

Mumps

## GROUP II (score of 3):

Bronchitis

Erysipelas

Pediculosis

Scabies

Coccidioidomycosis

Favus

Rat Bite Fever

Sporotrichosis

Common Cold

Foot &amp; Mouth Disease

Relapsing Fever

Tick Paralysis

Conjunctivitis

Impetigo

Ringworm

Vincent's Infection

Lymphocytic Choriomeningitis

*Medium Score Division*

## GROUP III (score of 4):

Dysentery, Bacillary

Influenza

Poliomyelitis

Trichinosis

Dysentery, Amebic

Measles

Rheumatic Fever

Encephalitis

Pneumonia

Septic Sore Throat

*High Score Division*

## GROUP IV (score of 5):

Ascariasis

Hookworm Disease

Scarlet Fever

Chancroid

Lymphopathia Venereum

Tetanus

Dengue

Malaria

Trachoma

Glanders

Meningococcus Meningitis

Tularemia

Gonorrhea

Puerperal Sepsis

Typhus Fever, Endemic

Granuloma

Rocky Mountain Spotted Fever

Undulant Fever

## GROUP V (score of 6):

Anthrax

Plague

Tuberculosis

Cholera

Psittacosis

Typhoid Fever

Diphtheria

Rabies

Typhus Fever, European

Leprosy

Smallpox

Whooping Cough

Paratyphoid Fever

Syphilis

Yellow Fever

portable group. The diseases in the medium score division (Group III) require further consideration before they can be classified as suitable for possible routine reporting. The high score division (Groups IV and V) can be considered of sufficient importance to the public health program to warrant requiring their reporting where that requirement aids the control program, since they rate high not only as to importance but also in regard to efficiency of control.

In the case of four of the diseases in the high score division the control program in North Carolina is so constituted that it is not necessarily aided by reporting. Ascariasis and hookworm disease are being eliminated by the excreta disposal program which is being carried out as widely as facilities permit, regardless of reporting. Puerperal sepsis is being eliminated by the im-

provement in standards for prenatal and obstetrical care for all economic groups of the population, an evolutionary development which is not dependent upon reporting. The potential danger of tetanus is known to be relatively constant from year to year so that morbidity data are no longer essential as a basis for planning the control program.

Of the thirty-three diseases in the high score division, therefore, there appear twenty-nine the reporting of which is distinctly valuable to the administration of the public health program in this state.

TABLE 3

Diseases in GROUP III (score of 4) having a control efficiency score of 2:	Diseases in GROUP III (score of 4) having a control efficiency score of 1:
<i>Subgroup A</i>	<i>Subgroup B</i>
Dysentery, Bacillary	Encephalitis
Dysentery, Amoebic	Influenza
Measles	Pneumonia
Septic Sore Throat	Poliomyelitis
Trichinosis	Rheumatic Fever

TABLE 4  
Major Communicable Disease Control Measures Available in North Carolina

Disease	Medical and Nursing Procedures			Sanitary Engineering Procedures	Other Procedures		
	Directed Toward Patient	General			Directed Toward Patient	General	
Anthrax	Isolation	Quarantine of contacts Investigation of source		Supervision of abattoirs	Diagnostic laboratory service	Destruction of infected animals and contaminated material Quarantine and immunization of exposed animals	
Chancroid	Therapy to eliminate infectiousness	Examination of contacts			Education regarding need for adequate treatment Distribution of free drugs	Education of public regarding sex hygiene	
Cholera	Isolation	Immunization Quarantine of contacts Investigation of source		Supervision of public water supply and excreta disposal Supervision of private excreta disposal	Diagnostic laboratory service	Education of public regarding water supply and excreta disposal	
Dengue	Screening from mosquito vector			<i>Aedes aegypti</i> mosquito control		Education of public regarding <i>Aedes aegypti</i> mosquito control	
Diphtheria	Isolation of patients and carriers	Immunization Quarantine of contacts		Supervision of milk supply	Diagnostic laboratory service Laboratory production of biological products	Education of public regarding immunization	
Dysentery, Amebic	Supervision of concurrent disinfection for patients and carriers	Investigation of source		Supervision of public water supply and excreta disposal Supervision of private excreta disposal Supervision of food handling	Diagnostic laboratory service	Education of public regarding water supply, excreta disposal, and food handling	
Dysentery, Bacillary	Isolation of patients and carriers	Investigation of source		Supervision of public water supply and excreta disposal Supervision of private excreta disposal Supervision of food handling	Diagnostic laboratory service	Education of public regarding water supply, excreta disposal, and food handling	
Encephalitis (Equine and St. Louis)	Screening from insect vector				Collection of morbidity data for research	Destruction of infected animals Quarantine of exposed animals	
Glanders	Isolation of patient	Quarantine of contacts Investigation of source				Destruction of infected animals Quarantine of exposed animals	

Gonorrhea	Therapy to eliminate infectiousness	Examination of contacts Instillation of silver nitrate into eyes of the new-born		Education regarding need for adequate treatment Diagnostic laboratory service Distribution of free drugs	Education of public regarding sex hygiene
Granuloma Inguinale	Therapy to eliminate infectiousness	Examination of contacts		Education regarding need for adequate treatment	Education of public regarding sex hygiene
Leprosy	Isolation	Quarantine of contacts		Education regarding need for adequate treatment	Education of public regarding sex hygiene
Lymphopathia Venereum	Therapy to eliminate infectiousness	Examination of contacts		Diagnostic laboratory service	Education of public regarding anopheline mosquito control, and personal prophylaxis
Malaria	Screening from mosquito vector		Anopheline mosquito control		Education of public regarding modification of disease by passive immunization of contacts
Measles	Isolation	Modification of disease by passive immunization of contacts			
Meningococcus Meningitis	Isolation	Quarantine and chemoprophylaxis of contacts		Diagnostic laboratory service	
Paratyphoid Fever	Isolation of patients and carriers	Immunization Investigation of source	Supervision of public water supply and excreta disposal Supervision of private excreta disposal Supervision of food handling	Diagnostic laboratory service Laboratory production of biological products	Education of public regarding immunization, water supply, excreta disposal, and food handling
Plague	Isolation	Immunization Quarantine of contacts Investigation of source	Extermination of rats and ratproofing		Education of public regarding ratproofing
Polioomyelitis	Isolation Referral for orthopedic care	Quarantine of contacts		Collection of morbidity data for research	
Psittacosis	Isolation	Quarantine of contacts Investigation of source			Destruction of infected and exposed birds Quarantine of suspected birds
Rabies	Isolation	Immunization of exposed persons		Diagnostic laboratory service Laboratory production of biological products	Destruction of infected animals Quarantine of exposed animals
Rocky Mountain Spotted Fever		Immunization		Diagnostic laboratory service	Education of public regarding personal prophylaxis
Scarlet Fever	Isolation	Quarantine of contacts	Supervision of milk supply		

(Continued on next page)

TABLE 4—(Continued)  
Major Communicable Disease Control Measures Available in North Carolina

Disease	Medical and Nursing Procedures		Sanitary Engineering Procedures	Other Procedures	
	Directed Toward Patient	General		Directed Toward Patient	General
Septic Sore Throat *	Isolation	Quarantine of Contacts Investigation of source	Supervision of milk supply	Laboratory production of biological products	Education of public regarding immunization
Smallpox	Isolation	Immunization Quarantine of contacts		Education regarding need for adequate treatment	Education of public regarding sex hygiene
Syphilis	Therapy to eliminate infectiousness	Examination of contacts		Diagnostic laboratory service	
Trachoma	Isolation			Distribution of free drugs	
Tuberculosis	Isolation	Examination of contacts X-ray survey	Supervision of milk supply	Education regarding need for adequate treatment	Destruction of infected animals
Tularemia				Diagnostic laboratory service	Education of public regarding tuberculosis
Typhoid Fever	Isolation of patients and carriers	Immunization Investigation of source	Supervision of public water supply and excreta disposal Supervision of private excreta disposal Supervision of food handling	Laboratory production of biological products	Education of public regarding immunization, water supply, excreta disposal, and food handling
Typhus Fever, Endemic		Investigation of Source	Extermination of rats, and ratproofing	Diagnostic laboratory service	Education of public regarding need for ratproofing
Typhus Fever, European	Isolation	Immunization Quarantine of contacts		Diagnostic laboratory service	Education of public regarding personal prophylaxis
Undulant Fever		Investigation of source	Supervision of milk supply	Diagnostic laboratory service	Destruction of infected animals
Whooping Cough	Isolation	Immunization Quarantine of contacts			Quarantine of exposed animals
Yellow Fever	Screening from mosquito vector	Immunization Investigation of source	<i>Aedes aegypti</i> mosquito control	Laboratory production of biological products	Education of public regarding immunization
					Education of public regarding <i>Aedes aegypti</i> mosquito control

\* Defined in North Carolina Communicable Disease Regulations as food or milk-borne type only. Investigation of source would, therefore, be routine. Scarlet fever cases are not routinely investigated as to source.

The diseases in the medium score division can be classified further as shown in Table 3.

Of the two subgroups shown in Table 3 subgroup A represents a group of diseases of moderate importance for which control measures are available that are not as efficient as those for the diseases in the high score groups, and subgroup B represents a group of diseases of moderate importance for which control measures are absent or poorly developed. Since the five diseases in the former group can be controlled to a certain extent, therefore, their reporting might be justified. In the case of trichinosis, as in tetanus, the potential danger has been fairly well established as being relatively constant from year to year so that reporting is not essential to the control program. The four diseases listed in subgroup B cannot be controlled to any effective extent pending further developments, so that their reporting would not be justified in this state except for statistical purposes, and then only because they represent diseases of considerable importance. Since further statistical study is needed in the case of encephalitis and poliomyelitis to aid in the development of control measures, they can properly be included in the reportable disease group. Other states might include rheumatic fever in this same category. The requiring of poliomyelitis reporting in some areas might be based on the need for locating the patients as an activity of the crippled children's program, in addition to the need for statistical study.

The twenty-nine diseases from the

high score division and the six from the middle score division constitute a group of thirty-five diseases which are suitable for reporting in this state and in the case of which definite reasons for reporting can be demonstrated.

This list was adopted by the North Carolina State Board of Health to be effective January 1, 1945.

Since the reporting requirement is only the first link in the chain of events constituting the control program, the more important of the actual public health services available to the physician and the public in North Carolina <sup>2, 3</sup> are presented in tabular form in Table 4.

#### SUMMARY

1. The diseases required to be reported in the various states of the United States are classified on the basis of their importance as a public health problem in North Carolina and on the efficiency of the control measures available.

2. By selection of the appropriate groups from the classification there is presented a list of diseases suitable for reporting where that procedure is an aid to the control program.

3. The more important individual control measures available in North Carolina for each reportable disease are listed in tabular form.

4. The method of selecting the reportable disease group and the listing of the control procedures available are presented in an attempt to answer the question "Why report?"

#### REFERENCES

1. Fowler, William. The Reportable Diseases. *Pub Health Rep.*, 59:317-340 (Mar.), 1944.
2. *Regulations of the North Carolina State Board of Health Governing the Control of Communicable Diseases*, 1944 Revision.
3. *The Control of Communicable Diseases*, Report of the American Public Health Association, 1945.



# Teaching Correctness of Thinking in Matters of Health

CARL J. POTTHOFF, M.D., M.P.H.

*Associate Professor of Biological Science and Public Health,  
University of Minnesota, Minneapolis, Minn.*

A LARGE share of health education is that which is presented in formal classes. The teacher thereof, like all teachers, has certain educational responsibilities beyond presenting facts from his field. Among others, these responsibilities include the development of the proper social attitudes and the cultivation of the thinking discipline. Many health classes contribute significantly to the development of good social attitudes. The thinking discipline appears, however, to be rather neglected.

Through fact presentation the teacher does promote good thinking. It is idle to hold that one can think effectively unless he has a fund of reliable facts. Health education today emphasizes facts; its contribution otherwise to the thinking discipline appears to be fragmentary. Students may be told to choose their facts carefully, to examine claims critically; popular beliefs and advertising copy may be "debunked." But education related to the broad underlying discipline appears, all in all, to be a side issue to fact presentation.

As a result of our educational lapses, we find that the good thinker, the reflective thinker, the thinker who tenaciously chews his problems before taking a position, is a rare creature in this day of widespread education. How many people in the general population really pride themselves on their understanding of and constant use of good thinking technics, rigorously quelling their emotions as they attempt to

make reason their guide? How many people have defined their values in life as an underlying base line for estimating excellence of thinking? How many pupils really understand the meaning of the scientific method, have learned beyond mere memorization of the steps in that method of study? How many know what is meant by an error of random sampling, or even if unfamiliar with the terms, understand the ideas of the *post hoc*, the false analogy, the hasty generalization?

It is rather irksome to note even our college graduates thinking so poorly in health matters. Within a short time the following remarks and questions have come from such favored people: "I got the formula for the baby's food from *Better Homes and Gardens*." "I took sun baths last summer and so didn't have any colds last winter." "The doctors today, despite all their education, are no better than the doctors of 1900 were." "Is it true that a person can cough up his tonsils?" "You know, doctors do not study the back." The shortcomings of these people, some of whom are college professors, would, I think, be better corrected by attention to the thinking discipline than to facts.

Shortcomings in thinking practices affect health behavior importantly. Even if we are uninterested in making general contributions to education, we will better prepare our pupils for meeting health problems if we devote some

time to the thinking discipline specifically, for we want to prepare them mainly for meeting future situations rather than for the present moment which fleets by. How better can we prepare them than by cultivating a good thinking discipline which they may bring to bear upon those future problems? If our time is too short for education in that direction, so also is that of every other teacher. Every teacher's task has unfortunately become no teacher's specific task. It does not suffice to teach the discipline in small, tag-along fractions; some time must be given specifically to teaching the broad aspects of correctness in health matter thinking.

There are several bad effects from emphasizing facts. Students come to regard fact possession as the great objective of education, and to minimize the importance of other objectives. They tend to believe that they themselves "just naturally" think well, and even that the thinking discipline is easy to practise. They tend to regard scientific facts as unassailable, failing to appreciate the limitations which even reliable facts have.

Further, we are not accomplishing as much as we may assume by stressing facts. Our disseminated facts are not nearly so well assimilated as we may believe. This is true even where we omit some facts and condense others in order to secure emphasis. It is natural for us to conclude from the work of our better students rather than from our "poorer results." The good student reacts more, is more vocal; many students, however, are rather inert in the classroom, and their shortcomings are not so evident. Perhaps we should read again and again just what our *average* students have written in their examinations in order to appreciate clearly the inadequacies of teaching single-heartedly "what there is to know."

Then too, let us recheck our pupils

a month or a year later to see whether they still retain the facts. We examine usually no later than just at the end of the course. Palmer Johnson,<sup>1</sup> on re-testing botany students at Minnesota only three months after they had finished their course, found that they answered correctly only one-half the questions they had properly answered in the examination given when the course was completed. Knowledge not used is speedily forgotten.

Another shortcoming of emphasizing facts alone is that the "truths" of today may not be the truths of tomorrow. The lay person does not appreciate this fact sufficiently well. His probing search for health knowledge is commonly finished when he completes his formal education; this knowledge, if remembered, may be retained dogmatically, though part of it will represent only misconception and outdated truths. Professor Johnson<sup>2</sup> has written: "It is gradually becoming recognized that few things are more ephemeral than information. One need only compare the discussions on the same topics in the several editions of a standard encyclopedia at intervals, say of decades, to note how short-lived so-called facts really are." Berzelius<sup>3</sup> has written: "The success of a scientist's life is usually not represented by any remarkable works or events, but rather by the truth of that which he taught, investigated, and communicated. He himself has no sound judgment in this matter. Often enough such judgment is lacking even among his contemporaries, who on the one hand may reject what an enlightened and impartial posterity will approve, or on the other will accept with enthusiasm something that later proves to be erroneous."

Emphasis on facts, further, is only partially successful in leading to improvement in behavior. Results of education are greater if the behavior angle

is directly and strongly presented with the fact dissemination. Consider that we give our medical students innumerable facts from which they should infer that the periodic health examination is important. Yet, partly because we do not carry this education through to its behavior aspects as related to them, physicians themselves seldom have such examinations. They are more likely than most people to develop active tuberculosis, and have little advantage over others in recognizing an early case in themselves. Yet how few have periodic x-rays. Those who smile self-righteously at the physicians might reflect, however, that the failing is common elsewhere. Some time ago the Minnesota Supreme Court, in handing down an opinion, remarked that lawyers, although recognizing the dangers common when no will has been made, notoriously seldom have made wills themselves.

Merely because, as illustrated above, even professors make gross mistakes in thinking technics, let us not regard our goal as beyond reach. Have we not too benevolently allowed our students to believe that they do think well? Have we not in science overemphasized facts, tested pupils on facts, graduated them because they possess facts? Where then can we expect them to point their efforts? Have we taught them the discipline of good thinking endlessly through the years? We have not learned well how to reward the student who thinks properly; we do not know how readily to distinguish differences in thinking behaviors in our overall grading system. We find it difficult to measure and demand improvement. Our common reliance on objective tests probably does not stimulate every-angle consideration of a problem to the extent that a subjective test does. Though we want our pupils to be cautious in drawing conclusions, we usually mark as wrong the answer,

"I don't know," thereby promoting guessing. Can we wonder, then, where are the students who revel, like certain Athenians of old, in their wide background in thinking discipline?

Educators in health and other sciences may excuse themselves by stating that their fields are so complex, their facts so numerous that little time is available for teaching how to think. The very fact of science complexity may, however, be used to defend the view that now, more than ever, students should be taught to think. To-day we give these students only a little from a highly specialized field. Common observation and careful studies show that where one studies an elementary science course, his self-assurance tends to increase faster than his knowledge increment warrants. Heil<sup>4</sup> reviews a study showing that college freshmen who had studied science in high school knew virtually no more about science than their colleagues who had not studied science. But the former were far more sure that they were right even on questions where they were actually wrong. This in science, where we thought we were especially teaching caution. Results like this have provided fuel for the antipathy of many specialists to popularization of science. Hence also we have popularized the expression, "A little knowledge is a dangerous thing." Why should a little knowledge in a specialized field be dangerous? Because the holder does not use his facts wisely; he has not been given, with the facts, tools for wisely using facts, that is, the technics of good thinking. We should have no fear of giving a little knowledge in a specialized field to a highly critical thinker.

And we shall, as specialization increases, meet still oftener the task of providing only limited education within the specialized fields for our students. People will be specialists only in a

limited area, and will be "outsiders" to all other fields. We go through life largely as "outsiders." Specialists may reflect that we want, need, and will get some of their information; and that it is a duty of all to teach us how to use this information wisely. It is a mistake to assume that some time, somehow, in some other course, pupils will learn how to use these facts properly. In any case, each teacher should cultivate good thinking habits as applied within his field. No student can be expected to develop good thinking habits if only one course stresses the matter.

Only selected, particularly important aspects of the thinking discipline can be presented by the health educator in such classes as personal hygiene. Careful experiments, such as a Minnesota study,<sup>5</sup> show that even thereby important improvements are realized. The students need first to appreciate that good thinking is difficult, requires intensive study in college, and life-long effort for achievement. The study of logic in the scope usually presented does not provide all necessary facets for critical thinking in health matters. The student benefits particularly from strong presentation of the scientific method and its implications, and from some attention to statistical inference, values, and logic. All college elementary course health texts should, I think, include a chapter devoted specifically to selected aspects of these subjects as applied to health matters. Lacking such texts, the instructor may distribute mimeographed material. We need examinations which will better measure thinking behavior. We need to reward the students for their efforts toward such improvement just as we reward them for assimilating facts. Having presented a brief discipline, we can frequently present examples of good and bad thinking, showing just what the contained errors are. \* Mimeographed

material illustrating errors in common experience offers an especially good teaching help. A topical approach for the teacher is herewith presented:

1. The scientific method—Surprisingly many students complete college without ever having formally studied this subject. Many, in fact, have never studied the theory of evolution, a study which strongly stimulates independent thinking. Teaching of the scientific method may be directed to specific objectives: to understanding that the method is a way toward truth and a test of the validity of facts, to understanding at least dimly of the immense complexity of science and the magnitude of the fund of scientific facts now accepted, to respect for the specialist and his opinion on matters within his field, to wise estimation of the reliability of informants. Thus the use of false data and the error of the neglected aspect may become less common.

2. Values as guides to good judgment—Few people have established in their own minds the values upon which their thinking and behavior will be predicated. An overall study of values is necessary so that one may have a good steering wheel as he goes through life. People do value health highly, but since one value is gained at some expense to another, they often choose against health even though recognizing it vaguely as a precious and perhaps irreplaceable commodity. The attitude of valuing may, of course, be antagonistic to the attitude of fact finding.

3. Awareness of problems—Many problems, even vital ones, are not recognized until they are thrust upon one, perhaps at a time when irretrievable loss has occurred. During adulthood we have important problems in relation to selection of a vocation, to making a living, to saving and investing, to selection of a husband or wife, to caring for the physical and mental development of our children, to selecting a home, to furnishing it properly, to cultivating leisure time interests, to developing a sound philosophy guiding our religious and ethical behavior, to our own physical and mental health, to our citizenship responsibilities. In their segmented education, the students are not given a perspective of the broad problems of adulthood. Many of these problems are never studied carefully. Young people, unless informed, have little conception of the health problems which will confront them. The student who would be a good thinker should be taught to search actively for problems demanding study. The teacher may list important health problems of adulthood.

4. Problem solving: use of relevant data—To solve our health problems we must first realize that they exist; then we must assemble our facts, eliminate any irrelevant facts, and draw the proper conclusion. The facts used must be reliable; and all the facts which bear significantly upon the problem must be used. Here the habit of going to authorities, to reading the literature, to studying the information of opponents, should be impressed. Thus the hidden aspect is better brought to sight. Too often conclusions are drawn merely on impulse. If one can teach students simply to withhold taking a position until study has been made, an immense gain toward good thinking occurs.

5. Problem solving: avoiding use of irrelevant data—Some facts of course are not germane to a problem. In health matters the irrelevant thesis is of particular importance. Our health problems should be decided on the basis of the essential soundness of the proposition, that is, upon reason, not for example upon emotion. An appeal to pity, to group or personal prejudice, to humor, to important names or groups, does not introduce the necessary logical evidence; often, in fact, it diverts one from careful scrutiny.

6. Selected errors in inference—Because of their importance in health matters, the *post hoc*, the false analogy, and the hasty generalization may very profitably be brought to the pupil's attention. Many examples should be used. The student should understand that a single example may illustrate several error types.

7. Statistics and good thinking—Specific attention to statistics is worth while. Statistics are much used in health matters, and are too readily accepted as reliable and without restrictions. Students should learn to be critical of statistics. How are they ob-

tained? Does the method have pitfalls? Is the measurement likely to be accurate? Is the sample biased? Is a control present, or should it be? Are there sufficient cases to warrant some generalization? Are the inferences justified?

After gaining some background in the discipline of good thinking, the students may, by self-activity, progress to formation of better habits. Thus health education will have better attained its objectives, and will have better discharged its share of responsibility to the overall education of the student. President Hutchins,<sup>6</sup> of the University of Chicago, has written concerning this responsibility as follows: "If education is rightly understood, it will be understood as the cultivation of the intellect. . . . Since education cannot duplicate the experiences which the student will have when he graduates, it should devote itself to developing correctness in thinking as a means to practical wisdom, that is, to intelligent action."

#### REFERENCES

1. Johnson, P. O. *Curricular Problems in Science*. Minneapolis: University of Minnesota Press, 1930, Ch. IV, pp. 65-104.
2. Leonard, J. P., and Eurich, A. C., editors. *An Evaluation of Modern Education*. New York: D. Appleton-Century, 1942, pp. 29-30.
3. Berzelius, Jacob. *Ciba Symposia*, 5:1490 (June-July), 1943.
4. *Op. cit.* 2, p. 198.
5. Studies in Higher Education. *Bull. Univ. Minnesota*, 42:24 (Nov. 4), 1939.
6. Hutchins, R. M. *The Higher Learning in America*. New Haven: Yale Univ. Press, 1936, pp. 67-68.

## Artists and Healers

The American Physicians' Art Association, through the generosity of the Mead-Johnson Chemical Co., announces \$34,000 in war bonds as prizes for the best art works by physicians memorializing the medical profession's "Courage and Devotion Beyond the Call of Duty" in war and in peace. Doctors

as artists are not a novelty; for a number of years the annual meetings of the American Medical Association have included an art exhibit by members. Further information can be secured from Dr. F. H. Redewill, Flood Bldg., San Francisco; or Mead-Johnson Co., Evansville 21, Ind.

# The Legal Basis for Venereal Disease Control

JAMES H. LADE, M.D., F.A.P.H.A.

*Director, Division of Syphilis Control, State Department of Health, Albany, N. Y.*

STUDY of the venereal disease control laws of New York State and a review of the laws of some of the other states and countries indicate that certain misconceptions which the medical mind has long since discarded remain in our law; that we continue to fail in the control of some cases because of deficiencies in our legal tools; and that we tolerate these defects because we can still accomplish part, though not all, of our tasks, in spite of them.

An attempt is here made to collate the medical facts and legal principles which are relevant to the problem and to present them in a logical fashion. For it is held that good law must be sound logic, and that the frequency with which it fits into real situations without straining points or appearing unreasonable to the non-legal observer is a measure of its excellence. When our legislation fails to describe what we consider legitimate public health practice, it must follow that the law is poorly framed, or that the practice has gone beyond the public interest. But the task of revision is not one for the lawyer alone. The structure of logic required is a compound of medical and legal fact in which the guide must be enlightened public health practice and the guard the constitutional right to personal liberty. This discussion will take into account no new facts nor novel approaches to them, for it is considered that the law should embody only verified fact and tested procedure.

Perhaps we should begin with the constitutional rights of the citizen. His illness is his personal affair, so long as he is not a public charge, until it affects others. But when the exercise of a personal right tends to interfere with the exercise of the rights of others, it becomes a matter of public concern; a nuisance, in a word. This situation arises when the disease in question is communicable, for certainly the exposure of others to contagion will result in curtailment of their liberties. It was upon the basis of such reasoning that the isolation of persons with communicable disease and the quarantine of premises came to be considered a justifiable curtailment of personal liberty. But we have in venereal disease a condition more complex than an acute communicable disease spread by way of the respiratory tract. Let us then consider the bare medical facts.

The venereal diseases are infectious under certain conditions of contact and only for limited periods, even in the absence of treatment. Given a patient willing to submit to adequate therapy and post-treatment observation, the risk of transmission is so slight as to be negligible, for the purposes of the public health. A very large fraction of venereal disease patients, apprised of their infections, will seek therapy voluntarily and some will remain under treatment until non-infectious. Is there then a necessity for law, which implies compulsion, to guard the public?

It is submitted that the venereal viruses are endemic among a fraction of the population which is sexually promiscuous, and that contagion spreads from this fraction to the more sober portion of the populace, resulting in an infected group considerably larger than the promiscuous alone. It is characteristically the people who are infected through wedlock, before birth, or during solitary indiscretions, who faithfully submit to therapy, needing only to be found to be controlled. But among the habitually promiscuous are the ignorant, the suspicious, the careless, the stupid, the criminal, the psychopathic, and the non-conformists who refuse examination, or, diagnosed as cases, refuse treatment, or, placed under therapy, discontinue it before non-infectiousness is attained. It is tenable opinion that the person who cares so little for his own welfare as to refuse examination or treatment is likely to be so heedless of the health of others as to continue exposing them to his infection. The type is familiar to any epidemiologist in the venereal disease field.

An accurate estimate of the respective importance of the private physician and the public health specialist in the control of venereal disease is impossible. But it is certain that the willing patient can be rendered non-infectious by the physician without the assistance of health departments. The official agency can help only in finding such persons and advising them to seek medical care, at whatever hands. Any check upon therapy of private cases made by health departments may be little more than score-keeping for annual reports unless those who become delinquent are placed and kept under treatment. The occasional persistently delinquent patient is more important to venereal disease control than the larger number who follow faithfully the advice of their physicians—more im-

portant because this patient is likely to be of the habitually promiscuous group which keeps the venereal viruses alive during periods of low incidence.

Now compulsion is not the only recourse in these cases—not even the first recourse. A substantial number of contacts resistant to examination and patients delinquent from treatment will respond to information, reassurance, persuasion, or assistance when unable to pay for examination or treatment. Indeed, the extent to which these measures are successful is to a degree a measure of the efficiency of a health department, and a demonstration of the superiority of our democratic government over a dictatorship. But there will always be a residue of cases resistant to all of these measures who are the kernel of the venereal disease problem. Here a show of force is frequently all that is necessary. Nevertheless, behind the facade there must be a solid structure of duly constituted authority, lest we have government by the whim of officialdom. Hence, law is necessary as an expression of sound medicolegal thinking in a problem which concerns all the people.

However, it is not feasible to define in the law these different types of persons infected with venereal disease. Such descriptive phrases as "persons likely to infect or to be the source of infection of any other person" describe the case which comes within the legitimate scope of the interest of a health authority, but require so much proof of the character of the suspected person as to emasculate legislation in which they are included. It may be easy for the epidemiologist to determine that a person named as a contact is likely to expose others in the future, but quite impossible to prove this in court, where hearsay evidence is not admissible, and where the erstwhile sex partners may, and usually will, refuse to testify. We know that a person with smallpox may

so conduct himself that his infection will not be transmitted to others, but we do not hesitate at isolation, nevertheless. Why then are we chary of similar measures in venereal disease? It is beyond the wisdom of health or judicial officers to determine the manner in which any person infected with venereal disease will behave in the most secret part of his existence—his sexual life. It is impractical, then, to consider future conduct in this question, and, by precedent of many years' standing in the law concerning other

communicable diseases, unnecessary.

The following laws have been framed as minimal requirements for a venereal disease program. They are not presented as the final word, nor as universally applicable in a nation as diverse in races and venereal disease rates as ours. In more specific form they have been enacted recently by the New York State Legislature. The penalty for failure to comply with this or any other section of the Public Health Law is a misdemeanor and punishable as such.

#### PUBLIC HEALTH LAW CONCERNING VENEREAL DISEASE

##### *Examination of Persons Suspected of Venereal Disease*

Whenever a health officer shall have reasonable ground to believe that any person within his jurisdiction is infected with any venereal disease, he may cause a medical examination to be made for the purpose of ascertaining whether such person is in fact infected with such a disease in a stage which is or may become communicable,<sup>1\*</sup> as defined in the Sanitary Code of the Public Health Council.<sup>2</sup> Every such person shall submit to such examination and permit such specimens of blood or bodily discharges to be taken for laboratory examination as may be necessary to establish the presence or absence of such disease or infection, or shall submit to quarantine<sup>3</sup> in a place and manner determined by the health officer. Any person so examined may be held in quarantine<sup>4</sup> until the results of such examination are known. The required examination may be made by such health officer, or by a physician selected by him, or, at the option of the person to be examined, by a licensed physician, who, in the opinion of the health officer, is qualified for such work, and is approved by him. The phy-

sician making such examination shall promptly make a report thereon to said health officer, but shall not issue a certificate of freedom from venereal disease to or for the person examined.

Upon refusal<sup>5</sup> of such person to submit to such examination or to permit such specimens of blood or bodily discharges to be taken for laboratory examination, the health officer may apply to a county judge or justice of the supreme court for an order compelling compliance. The judge or justice to whom application for such order is made may, upon good cause shown, require the suspected person to appear before him at chambers forthwith,<sup>6</sup> or, upon such notice as he shall direct, to show cause why the order should not be granted, and if after hearing, the justice, judge, or magistrate shall determine that the suspected person may constitute a source of infection to others, the justice, judge, or magistrate may direct by order that the suspected person shall submit to such examination and permit such specimens of blood or bodily discharges to be taken for laboratory examination, or shall comply with the restrictions imposed by quarantine. All papers pertaining to any proceeding for such an order compelling compliance shall, if placed on

\* Annotations will be found at the end of this section on the Public Health Law.



file as court records or otherwise, be sealed and withheld from inspection; and no person shall be allowed access thereto except upon an order of a justice of the supreme court or a judge or magistrate of the court wherein the proceeding was had. No order for access and inspection shall be granted except on due notice to the person named therein as the suspected person and on good cause shown.

### *Requirement of Treatment for Venereal Disease*

The health officer may require any person within his jurisdiction who is found to be infected with a venereal disease in a stage which is or may become communicable as defined in the Sanitary Code of the Public Health Council, to submit to such treatment or quarantine or both as described for the termination of infectiousness in said Sanitary Code. The health officer shall define the place and limit the area within which such persons shall be quarantined, and the conditions under which such treatment or quarantine, or both, shall be terminated.

### ANNOTATIONS

#### 1. "*In a stage which is or may become communicable*"

This clause is designed to cover four types of cases, (a) the untreated symptomatic (primary or secondary syphilis or acute gonorrhea) case, (b) the incompletely treated symptomatic case, which may revert to infectiousness upon discontinuance of treatment, (c) the untreated asymptomatic case of recent onset, whose infectiousness may not be demonstrable at the moment of examination, and, (d) the untreated asymptomatic case of unknown duration in the young adult.

#### 2. "*The Sanitary Code of the Public Health Council*"

In order to avoid encumbering the law with definitions which are essentially medical and which may change frequently as knowledge advances, or personnel become available to superintend the examination and therapy

of additional categories of venereal disease, the exact definition of "communicable" is left in New York State to the Public Health Council, a medical body roughly corresponding to a state board of health. It is held that such written definition is essential, to protect the patient or contact from captious definitions of communicability.

#### 3. "*or shall submit to quarantine. . .*"

The alternative, "quarantine," is included in this clause to cover the sects whose doctrines do not permit of medical examination or treatment.

The term "quarantine" is preferred to the more precise term "isolation" because of the lay concept of the meaning of these terms. "Quarantine" has a long and accepted usage inclusive of personal quarantine; "isolation" summons visions of bread and water and a solitary cell.

#### 4. "*Held in quarantine until the results of such examinations are known*"

This provision of the law has never been tested in court, and may be of dubious legality.

#### 5. "*Upon refusal of such person to submit. . .*"

By way of proof of adequate notice to submit to examination having been served upon persons suspected of venereal disease, the health officer is advised to utilize a formal written order before proceeding to the next step in prosecution. Served only upon persons who do not comply with a verbal request, this order alone, typed impressively on blue-backed legal paper, will frequently accomplish the desired objective. In the case of transients and persons whose residence may be easily changed, such an order may require immediate compliance, and be served in the presence of a police officer.

#### 6. "*. . . judge . . . may . . . require the suspected person to appear before him in chambers. . .*"

Most cases against suspected persons who actually appear at a hearing will fail of a conviction, since contact investigations must depend upon hearsay evidence, and the sources of our information will usually refuse to testify, as discussed in the foregoing. Yet the judicial officer who has been well indoctrinated with the theory and practice of venereal disease control may be persuaded to see these people in chambers, and may obtain consent to examination from them, even though complete evidence is lacking.

## SANITARY CODE CONCERNING VENEREAL DISEASE

By way of implementing the above provisions of the law, definitions of the communicable stages and amounts of treatment as required for their termination or completion of quarantine should be included in the Sanitary Code, as follows:

*Regulation 40—Communicable stages of syphilis.*

A case of syphilis shall be considered communicable when untreated or insufficiently treated as defined in Regulation 41 under the following circumstances: (1) when the *Treponema pallidum* is identified by darkfield examination of the body fluids of the patient; or (2) when the serological test for syphilis is positive and the patient has lesions suggestive of primary or secondary syphilis; or (3) when the serologic reaction is positive, and a history of characteristic onset within one year has been obtained, or it is known that the serological reaction has been negative within a one year period; or (4) when serological or clinical evidence of infectious relapse has developed after the conclusion or discontinuance of therapy; or (5) when the serological reaction is positive in the course of pregnancy in the untreated or inadequately treated female; or (6) when the serological reaction is positive in an infant between 2 months and 2 years of age.

It is provided however that no person without darkfield positive lesions who is known to have been infected more than 5 years shall be considered to have syphilis communicable to others otherwise than per uterum in the course of pregnancy.

*Regulation 41—Adequate treatment for syphilis defined*

The infectiousness of a person with communicable syphilis shall be considered terminated by: (1) the administration of 60 units of antisypilitic drugs, one injection of a trivalent arsenical of the arsphenamine or phenarsine group being equivalent to two units, and one injection of a bismuth or mercury salt being equivalent to one unit; or (2) the administration of 1,200 mg. of a phenarsine compound within a period of 2 months or less, followed by 1 year of observation without clinical or serological evidence of relapse; (3) the administration of at least 1.2 million units of penicillin in a period of 10 days or less, followed by 1 year of observation without clinical or serological

evidence of relapse; (4) such combinations of artificial hyperpyrexia and chemotherapy as are equivalent to the above, followed by 1 year of observation without evidence of relapse; provided, that the recurrence of infectious lesions, or serologic relapse shall be indications for the resumption of therapy, regardless of previous treatment.

*Regulation 42—Communicable stage of gonorrhea defined*

Any person shall be considered to be in the communicable stage of gonorrhea (1) when the *Neisseria gonorrhoeae* are found by microscopic examination or culture in bodily secretions or tissues of said person; (2) when the female patient admits sexual contact with persons known to have or have had gonorrhea, until therapy has been successfully administered. When the *Neisseria gonorrhoeae* have not been found by culture or microscopic examination in three successive specimens taken on three days during which therapy has not been administered, the communicable stage shall be considered to have been terminated.

*Regulation 43—Adequate treatment for gonorrhea defined*

The infectiousness of gonorrhea in a communicable stage shall be considered terminated by the administration of (1) 20 gm. of sulfathiazole or sulfadiazine in 5 to 10 days, or (2) penicillin in a dosage of 200,000 units parenterally, provided that the gonococcus is *not* identified in at least one post-treatment specimen examined by culture or three specimens for microscopic examination taken on different days following therapy.

*Regulation 44—Quarantine for venereal disease*

Alternative Quarantine—Any person ordered by a health officer to submit to examination under section 343gg of the Public Health Law, may elect to submit to quarantine as an alternative to such examination, when the health officer may order him or her to remain within such limits and to deport himself or herself in such manner that no other person shall be exposed to the venereal disease suspected to be in a stage which is or may become communicable. Such an order of quarantine may specify the suspected person's home or living quarters, or may direct him or her to proceed to and remain in an institution other than a penal institution, until the person may be reasonably considered no longer infectious.

Temporary Quarantine: Any person ordered by a health officer to submit to exami-

nation pursuant to section 343gg of the Public Health Law, may be required by order of quarantine to remain in an institution or within other limits determined by the health officer until the results of examination are known.

Conditional Quarantine: Any person ordered by a health officer to submit to treatment for venereal disease shall be required to remain within limits specified by the health officer and to submit to such examinations as are necessary to determine the effectiveness of therapy.

#### SUMMARY

1. Prosmiscuity is the backbone of venereal disease transmission.

2. The promiscuous patient is more likely to refuse examination or treat-

ment than the person of regular sexual habits.

3. The contact who refuses examination, and the delinquent patient who refuses therapy should be compelled to submit to these procedures, or be quarantined when resistant to persuasion.

4. The basis for compulsion should be the law.

5. Such provisions in the public health law should clearly express proper principles of venereal disease control.

6. A draft of a law concerning the examination of contact and the continuance of treatment of known cases is presented.

---

## Hawaii Health Committee to Broaden Activities

The Chamber of Commerce of Honolulu recently approved a plan for streamlining and broadening the scope of activities of its Public Health Committee. According to the Honolulu *Advertiser*, Dr. Forrest J. Pinkerton, Honolulu, Chairman of the committee, announced that as a result of the adoption of his reorganization plan the former Oahu Health Council, representing all social service and related health groups, would be reactivated, permitting virtually all public health activities to be coordinated through the relationship between the Public Health Committee and other welfare and public health agencies.

According to the new plan, certain ex officio members of the Public Health Committee by virtue of their positions with other public health agencies will be discontinued and will have their representation through the Oahu Health Council. An advisory committee is to be organized from among the membership of the Public Health Committee. Raymond G. Nebelung, new Executive Director of the Health Committee, is to be charged with coordination of the various groups, working under Dr. Pinkerton's direction, and a health specialist, Allice Spillane, formerly with the Washington State Health Department, will be added to the staff.

# Effect of the War on the Distribution of Full-time Local Health Officers

BURNET M. DAVIS, M.D., AND MARION E. ALTENDERFER

*Surgeon (R) and Assistant Statistician, Division of Public Health Methods,  
U. S. Public Health Service, Bethesda, Md.*

IT is well known that serious civilian shortages of many types of specialized personnel have developed because of the war. The effect on physicians has been especially marked because of the high ratio of medical officers to total strength required by the armed services. Studies have been reported of the effect of the war on distribution of private practitioners.<sup>1, 2</sup> Recent publication of a 1945 revision of the *Directory of Full-time Local Health Officers*<sup>3</sup> has presented an opportunity to analyze the war's effect on another important category of health personnel—the local health officer.

The Directing Board of Procurement and Assignment Service, early in the war, established a policy of declaring full-time health officers essential in their civilian positions. In spite of this policy, many health officers entered the armed forces. The number of available replacements has been sharply cut because a large proportion of recent medical graduates have been going into military service directly from internships. Some health officers have left local health departments for work in other health agencies, industry, or private practice.

Health departments have met the resulting shortage in various ways. In some cases, the services of private practitioners have been secured on a part-time basis. In other instances, two or more health departments have been

placed under the supervision of one health officer. Under its program for Emergency Health and Sanitation Activities, the U. S. Public Health Service has detailed a number of its commissioned officers to serve as local health officers. But in many instances, vacancies have simply not been filled, and the health department staff has carried on without a health officer.

## MATERIAL AND METHOD

In order to study these changes quantitatively, use has been made of two editions of the *Directory of Full-time Local Health Officers*, which appears from time to time in *Public Health Reports*. These Directories are compiled from material submitted by the several state health officers. Every effort is made to check the accuracy of the data, but it is believed that some of the information may be incomplete. This is especially true of the professional degrees held by the health officers. The 1942 edition,<sup>4</sup> based on data as of December 1, 1941, gives the pre-Pearl Harbor picture of local health organization. The latest edition,<sup>3</sup> revised to January 1, 1945, shows the situation after three years of war. In addition to the two directories, use has been made of the material furnished by the state health officers, on which the latest edition of the Directory was based.

Local health departments are of five

types: single county, city, city-county, state district, and local district. The first two designations are self-explanatory. A city-county unit is defined, for the purposes of the Directory, as "a county with a civil subdivision having a population of 10,000 or greater which contributes to the support of the unit." Both state and local districts may be composed of several counties or parts of counties, townships, or municipalities, or a combination of these elements. In most states, however, the districts consist of groups of counties.

It should be emphasized that the Directory attempts to list only "full-time" health officers, and defines a full-time health officer as "one who does not engage in the private practice of medicine, and devotes all his time, energies, and activities to his duties as health officer." The Directories list, by state, the names of the local health departments, the political units included, the types of jurisdictions, the names of the health officers (including professional degrees), the post office addresses, and the official titles of the health officers. Health departments which have had or are intended to have full-time health officers, but which had none at the time of the Directory date, are listed as having temporary vacancies. In the present study, tabulations were made of the number of health officers with M.D. degrees, with M.D. and public health degrees, and with other degrees or with no degrees listed. Counts were also made of the number of vacancies and the number of "acting health officers." The information furnished by the several state health officers for the 1945 edition of the Directory showed that the title "acting health officer" apparently had different meanings in different states. In some, it was used to designate a local physician serving as health officer on a part-time basis. In others, the title was used for any person serving

in the place of a health officer on military leave. In some cases it was not possible to tell precisely what was meant by this title.

No attempt has been made in this report to show the numbers of single county, city-county, and district health departments separately since the definitions of these types of county jurisdictions vary from state to state. In those states where district health department boundaries do not follow county lines, it was necessary to estimate the total number of counties covered by organized health departments. In the tabulations of the number of health officers, a health officer serving more than one health department was counted only once. However, in the tabulations of the number of political units covered by organized health departments, a unit was counted as having health officer coverage whether or not its health officer served more than one health department.

#### FINDINGS

The results of the tabulations from the two Directories show that there are fewer health officers on duty in 1945 and that a smaller number have advanced degrees than in 1941. While professional degrees are not a precise measure of training and qualifications for the position of health officer, they are an indication of background and education. Table 1 shows the distribution of health officers in 1941 and 1945 by professional degrees held. The table shows that while there was a decrease of 13 per cent in the total number of health officers, the decrease in the number of health officers holding both M.D. and public health degrees was 30 per cent. There was actually a slight increase in the number of health officers without M.D. degrees and a considerable increase in the number of "acting health officers."

The change in the actual number of

TABLE 1

*Distribution of Local Health Officers by Type of Professional Degree, 1941 and 1945*

<i>Type of Professional Degree</i>	<i>1941</i>	<i>1945</i>	<i>Per cent Change</i>
Total health officers	1,148	1,004	-13
Total with M.D. degree	1,020	856	-16
M.D. degree only	762	634	-17
M.D. and public health degree	258	180	-30
U. S. Public Health Service officers	0	42	—
Total without M.D. degree	103	109	+6
"Acting health officer" *	25	39	+56

\* For definition, see text.

health officers, shown in Table 1, does not reveal the whole picture. Consideration must also be given to the change in the number of political units which health officers serve or which have been left with vacancies. Table 2 shows, for 1941 and 1945, the total number of counties and cities covered by organized health departments, both with health officers and with temporary vacancies in the health officer's position. The city-county units have been included with the counties. The number of cities shown in the table is a count of cities with individual health departments and does not include either the cities in city-county units or the cities in district health departments.

It will be seen from the table that the total number of political units with organized health departments has in-

creased slightly (about 4 per cent). However, the number of units covered by health departments that actually have a health officer has decreased 11 per cent. In 1941, there were 1,675 counties covered by health departments with health officers. This represented 55 per cent of the 3,070 counties in the country. The corresponding figure for 1945 is only 48 per cent. If we consider the total counties covered by organized health departments without regard to whether there is a health officer or a vacancy, the per cent was 58 in 1941 and 60 in 1945.

So far as data are available, there appears to have been comparatively little change in the number of cities with organized health departments. The small decrease is accounted for in part by the consolidation of some city health

TABLE 2

*Distribution of Political Units by Health Officer Coverage, 1941 and 1945*

	<i>1941</i>	<i>1945</i>
Total number of political units * with organized health departments	2,001	2,072
With health officers	1,905	1,701
With vacancies	96	371
Per cent with vacancies	5	18
Counties (including city-county units)	1,767	1,847
With health officers	1,675	1,478
With vacancies	92	369
Cities *	234	225
With health officers	230	223
With vacancies	4	2

\* Excludes city health departments reported for five states in 1945. Data were not available for these health departments in 1941. The 29 city health departments shown for these states in 1945 were omitted from the tabulation to make the data for the two periods comparable.

departments with their county units to form city-county departments, and in part by the dropping of some city health departments from the list of full-time jurisdictions.

A comparison of the figures in Tables 1 and 2 shows that there has been a decrease of 204 political units covered by health departments with health officers, but a loss of only 144 health officers. In some instances, the loss of health officers has been offset by the formation of new districts. On the other hand, the loss of a district health officer may result in as many as 12 counties shifting into the vacancy category. The latter situations outweigh the former with the result noted above.

It is of interest to observe the change that has taken place in the distribution of health officers in relation to the distribution of population. It is well known that the distribution of private

practitioners in relation to population showed great variation from state to state before the war. Despite state quotas set by the Procurement and Assignment Service as guides for recruitment, some states, especially in the South, which had relatively few physicians in relation to population before the war supplied more than their quota to the armed forces. The war thus has accelerated the trend of the past 20 years for the ratios of physicians to population to become less favorable in the states that already had unfavorable ratios.<sup>1, 5</sup>

Reference to the last three lines of Table 3 shows that the reverse has been the case with respect to health officers, considering only the four major geographic regions of the country. The change has been in the direction of making the distribution of health officers more nearly the same as the distribution of the population. For ex-

TABLE 3

*Distribution of Local Health Officers by Type of Professional Degree, in Four Major Geographic Regions, 1941 and 1945*

Type of Professional Degree	Geographic Region *							
	Northeast		South		Central		West	
	1941	1945	1941	1945	1941	1945	1941	1945
Total health officers	204	198	617	490	226	209	101	107
Total with M.D. degree	108	96	607	464	219	199	86	97
M.D. degree only	79	54	464	377	159	145	60	58
M.D. and public health degree	29	41	143	70	60	41	26	28
USPHS officers	0	1	0	17	0	13	0	11
Total without M.D. degree	93	96	1	3	2	7	7	3
"Acting health officer"	3	6	9	23	5	3	8	7
Per cent distribution								
1943 population †		27		31		30		12
1941 health officers		18		54		19		9
1945 health officers		20		49		21		10

\* Major geographic regions include the following regions used by the Bureau of the Census:

Northeast: New England and Middle Atlantic  
 South: South Atlantic, East South Central and West South Central  
 Central: East North Central and West North Central  
 West: Mountain and Pacific

†From: Estimated Civilian Population of the United States, November 1, 1943. Population--Special Reports, Series P-44, No. 3, Bureau of the Census. February 15, 1944.

Since population figures are not available for the same dates as the tabulations of health officers, the Census figures for the date nearest to the middle of the period 1941-1945 were used.

ample, the Northeast, with 27 per cent of the population of the country, had only 18 per cent of the health officers in 1941, but now has 20 per cent. The South, with 31 per cent of the population, had 54 per cent of the health officers in 1941, but now has only 49 per cent.

Table 3 also shows the geographic analysis of the data presented in Table 1. It is seen that the total number of health officers decreased between 1941 and 1945 in each geographic region except the West. The decrease was small in the Northeast and the Central regions, but was over 20 per cent in the South. Thus the South has not only lost proportionately more private practitioners than the rest of the country but also has lost many more health officers. The increase in the number of health officers with M.D. degrees in the West can be accounted for by the 11 Public Health Service officers assigned to local health departments in this region. The greatest increase in the number of "acting health officers" and the largest number of Public Health Service officers are both found in the South, which lost the most health officers.

Certain facts about the type of health officer employed in various sections of the country are brought out by Table 3. Health officers without M.D. degrees are found almost entirely in the Northeast, where they represented approximately 45 per cent of all the health officers in the region both in 1941 and 1945. The South had the highest proportion of health officers with M.D. degrees (98 per cent) in 1941. However, the proportion of health officers holding both M.D. and public health degrees was highest in the West and lowest in the South. Comparable figures for 1945 cannot be computed because the public health degrees were not listed in the Directory for the Public Health Service officers.

#### SUMMARY AND CONCLUSION

Tabulations made from the 1942 and 1945 editions of the *Directory of Full-time Local Health Officers* show certain effects of the war on the number and distribution of full-time local health officers. The most important changes which have taken place are:

1. There has been a decrease of 13 per cent in the total number of full-time local health officers on duty.
2. While the total number of political units covered by organized health departments has increased 4 per cent, the number covered by health departments which have a health officer has decreased 11 per cent.
3. In 1941, 58 per cent of the counties in the country were covered by organized health departments, and 55 per cent by health departments which had a health officer. In 1945, the corresponding figures were 60 per cent and 48 per cent.
4. The greatest decrease in the number of health officers has been in the South. The West is the only region showing an increase.

It is not possible, on the basis of available data, to evaluate the immediate and latent effects of the depletion of health officer personnel on the health of the nation. The data show clearly that the depletion has been considerable. It has not been fully compensated by reorganization at the local level or by detail of Public Health Service officers, most of whom have been sent to areas of special war-created needs. Experience in the formation of new districts to meet the emergency may accelerate the trend away from single county units which was apparent before the war.<sup>6</sup> It is to be hoped that the data presented on the number of vacancies existing and on the relatively small number of health officers holding degrees in public health, may stimulate returning medical veterans to seek public health training and opportunities in the vital field of public health practice.

#### REFERENCES

- 1 Perrott, G. St. J., and Davis, Burnet M. The War and the Distribution of Physicians. *Pub. Health Rep.*, 58:1545-1554 (Oct 15), 1943
- 2 Hearings before a Subcommittee of the Committee on Education and Labor of the United States



Senate, 78th Congress, Pursuant to S. Res. 74, Part 6, pp. 2121-2125. U. S. Gov. Ptg. Office, 1944.

3. Directory of Full-time Local Health Officers (revised January 1), 1945. Repr. No. 2608 from *Pub. Health Rep.*

4. Directory of Full-time Local Health Officers, 1942. *Pub. Health Rep.*, 57:328-360 (Mar. 6), 1942.

5. Mountin, J. W.; Pennell, E. H., and Nicolay, V. Location and Movement of Physicians, 1923 and 1938—Turnover as a Factor Affecting State Totals. *Pub. Health Rep.*, 57:1752-1761 (Nov. 20), 1942.

6. Kratz, F. W. The Present Status of Full-time Local Health Organization. *Pub. Health Rep.*, 57: 194-196 (Feb. 6), 1942.

## Dental Health Service in Local Health Units

*Local Health Units for the Nation*, recently published, offers a plan for the organization of local health services on at least a minimum basis. The plan includes a dental health program as an integral part of local health service, including dental health education both in schools and in the community at large, as well as prophylaxis and corrective work for preschool and school children whose parents are unable to meet the cost of such care.

For such a program it recommends the employment of both full-time and part-time dentists, the former as directors of dental divisions in units with populations of 100,000 or more, the latter practising dentists. It recognizes that, as programs are developed and personnel becomes available, many areas will wish to employ full-time dentists to replace local dental practitioners on a part-time basis.

For the nearly 1,200 local health units through which the committee proposes the administration of local health service, a total of nearly 3,800 dentists is recommended, of whom nearly 12 per cent would be in full-time service. The recommended number is three times the number employed by local health departments and school boards in 1942, when 307 full-time and 959 part-time dentists were reported.

The report further suggests the use of dental hygienists as auxiliary workers. Legislation of several states either

does not license such workers or limits them to dental health education. The committee, however, in view of the meager dental health services now currently available through official or voluntary agencies, recommends the use of dental hygienists both for dental health education and for prophylaxis, and such legislation as will make this possible. Nearly 4,300 dental hygienists are recommended, approximately one per 30,000 population. In 1942, 372 dental hygienists were reported employed by local health departments or school boards of only 23 states, whose aggregate 1940 population was nearly 82,000,000. Thus dental hygienists were employed in the ratio of one to more than 200,000 persons. The 25 states without dental hygienists in local health services had a population of nearly 50,000,000; they include large population aggregations such as Illinois, Indiana, and Texas, as well as more sparsely populated states like Arizona, Nevada, Utah, Vermont, Wyoming, and the Dakotas.

These figures, both as to number of dentists and dental hygienists currently employed and the number needed for a minimum program, indicate how little dental service has been developed by local health department. They suggest that a dental health program should occupy many more of both professional and sub-professional personnel than is now the case.

# Statistical Methods in Anthropometric Studies in the Field of Nutritional Research\*

RACHEL M. JENSS, Sc.D.

*Washington, D. C.*

I HAVE been asked to discuss some of the problems involved in the use of statistical methods in anthropometric studies in the field of nutritional research. Perhaps the most elementary illustration of the statistical method in this field is the single case study; for example, the measurements of a French boy, reported by Buffon in 1777.<sup>1</sup> Here the statistical method is simple. We have one individual. We measure him at stated intervals over a period of years and record the findings. We learn how much he weighed at successive ages and how tall he was. For example, we learn that his height increased slowly and regularly during the age period 6 to 8 years; that he started to "shoot up" at about 12 years of age. Thus we learn the pattern of his growth, but we do not attempt to evaluate it as good or bad, or, in more orthodox terms, as "normal" or "abnormal," unless some of the measurements show deviations from this boy's own growth pattern.

When we measure a group of children in the same way as Buffon measured the French child, we still have a descriptive picture, but nothing more. If the same identical children are measured in successive years, the de-

scription is more satisfactory than if some children of a given age are measured, and some at the next older age, and some others at the next succeeding age, etc. The limitations of the latter procedure have been adequately outlined by Franz Boas in his study of the growth of Toronto children, published in 1898.<sup>2</sup> But even when the same group of children are studied at succeeding ages, the measurements of the children and their growth patterns are a reflection of the kind of children studied. For example, the growth pattern of a group of Negro children does not follow the growth pattern of a group of white children. The growth pattern of a group of boys does not follow the growth pattern of a group of girls.

Now the fact that different kinds of children show different growth patterns means that in an experimental study, the control and experimental groups must be identical with respect to all characteristics which may be related either directly or indirectly to the one being studied. Let me put it another way in order to bring out the particular point I wish to make:

An infant is not just an infant. A pound is not just a pound. One drop of viosterol is not just one drop of viosterol.

Because human beings differ they respond differently to the same stimulus. In order to test satisfactorily any given

\* Based on a paper presented at a Joint Session of the Vital Statistics and Nutrition Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

treatment or food we must give it to and withhold it from groups as comparable as possible in respect to characteristics that may influence the results. A few examples will illustrate this problem.

What is a premature infant? I do not foolishly propose to try to answer this question. I am sure that even pediatricians who have specialized in this field would hesitate to answer. But I am also quite sure that the criteria used for identifying premature infants for clinical purposes are not entirely satisfactory for experimental studies. One could profitably examine the historical development of the criterion that is commonly used today for identifying premature infants; namely, a birth weight of 2,500 grams or less. On what basis was this criterion selected? We know that, on the average, Negro infants weigh less at birth than white infants. Is it reasonable then to assume that a Negro infant weighing 2,500 gm. has the same maturity as a white infant weighing the same amount? One may inquire whether the two infants are of the same sex or of opposite sexes, whether one infant had more adequate prenatal care than the other, etc.

But let us assume that the two infants are identical in all respects except race. If we study the two infants by roentgenogram, we will find evidence that the osseous development of the Negro infant is more advanced than the osseous development of the white infant. The center of ossification for the cuboid bone is present. So is the head of the humerus, the capitae, the hamate, and the third cuneiform. But all these centers are absent in the roentgenograms of the white infant.

Suppose we feed the two infants during the first three weeks of life a milk mixture made by the same formula. We shall probably find that the Negro infant's gain in weight is smaller than

the white infant's. Does this mean that he is not gaining as satisfactorily as the white infant? Such an interpretation is not justified as there is some evidence that the growth pattern of new-born Negro infants does not coincide with the growth-pattern of new-born white infants; that during the first few days of life the weight gain of Negro infants is smaller than the weight gain of white infants. This finding is important in evaluating the response of white and Negro infants to a given feeding formula.

Let us go on to discuss these two infants. Let us assume that they are receiving 135 I.U. of vitamin D per day. Too small an amount? Probably, but which infant is more likely to become rachitic? There is some evidence to indicate that the Negro infant is less likely to become rachitic (roentgenographic examination) than the white infant. (The onset of the disease is to be distinguished from its progression.)

What is the significance of all this discussion? Is it not highly theoretical and somewhat irrelevant? To a certain extent, yes. It serves only as a warning. The results of nutrition experiments that depend in part, either directly or indirectly, on anthropometric measurements are not always what they seem to be. If, for example, we study the incidence of rickets in white and Negro infants, using a given form and amount of Vitamin D, and the control group is overweighted with Negro infants, while the experimental group is overweighted with white infants, we can confidently expect that, on the average, the incidence of rickets in the control and experimental groups will not be the same as it would be if the situation were reversed and the control group were overweighted with white infants and the experimental group with Negro infants. The same is true of sex. The response of male infants differs

from the response of female infants. I will even go so far as to say that, in general, if no difference appears in the response of the two sexes, then the method of observation is too crude to detect the difference or something has gone wrong with the experiment.

Similar problems are clearly demonstrated in studies to be reported by the U. S. Children's Bureau in coöperation with other child research groups. One of these studies is concerned with weight at birth. Controlling various factors known to be closely associated with the infant's weight at birth reveals large variations in birth weight, both in the average or typical weight and in the dispersion of the infants' weights about this average. For example, take two groups of white infants born in the same hospital, that differ in all the following characteristics: sex, parity of mother, complications of the mother's pregnancy, labor or delivery, attendant at delivery (private or resident physician).<sup>\*</sup> The infants in one group have characteristics that are associated with a large birth weight:

Sex .....	Male
Parity of mother....	Multipara.
Complications of pregnancy, labor or delivery .....	None
Attendant at delivery.	Private physicians

All the infants in the other group have characteristics that are associated with a smaller birth weight:

Sex .....	Female
Parity of mother....	Primipara
Complications of pregnancy, labor or delivery .....	Serious obstetric complications
Attendant at delivery.	Members of the resident staff of the hospital

The difference in the average weight at birth of these two groups of infants is

427 grams, approximately a pound; the percentage of premature infants is less than 1 per cent in the group of male infants, compared to 11 per cent in the group of female infants. To repeat, for these white male infants, whose mothers were muliparae with no complications of pregnancy, labor, or delivery, and who were under the care of qualified obstetricians and were delivered on the private service of one hospital in the city in which most of them were residents, the average weight at birth was 3,561 gm. (39.23 gm.)<sup>\*</sup>; 0.7 per cent (0.01 per cent) of these infants weighed less than 2,500 gm. On the other hand, for the white female infants, whose mothers were primiparae with serious obstetric complications of pregnancy and who were under the care of the resident physicians in the same hospital, the average weight at birth was 3,134 gm. (49.40 gm.); 10.6 per cent (2.6 per cent) of these female infants weighed less than 2,500 gm.

Where does this kind of discussion lead us? We are tearing down accepted standards but are leaving nothing in their place. Certainly it is impossible or impractical in many instances to control all such factors. This does not prevent us, however, from recognizing the limitations of the tools and procedures at our disposal and attempting to improve them, especially in experimental work.

It may be well to cite another example. A Negro woman is admitted to a hospital with preëclamptic toxemia. According to her medical history, the period of gestation is about 7 months. At first the obstetrician is undecided about terminating the pregnancy. What are the chances of the infant's surviving? Intrauterine x-rays show that the osseous development of the fetus is well advanced and so the obstetrician

\* Attendant at delivery is associated to some extent with socio-economic status, prenatal care, etc.

\* Figures in parentheses are the standard deviations of the corresponding statistical measures.

decides to induce labor. The Negro woman is delivered of a female infant weighing 2,200 gm., whose hospital course is uneventful. Had the mother been a white woman, and had the osseous development of the fetus been less advanced, the problem would have been an entirely different one.

Another study, made by the U. S. Children's Bureau in coöperation with other child research groups is concerned with the relative value of certain types of feeding for premature infants. Do such infants do better on human milk, on a cow's milk, or on a half skim milk formula? Now some pediatrician may say: "When I order a formula for a premature infant, I never consider race or sex." Undoubtedly it is unnecessary to do so for most clinical purposes, but it is necessary for research purposes, particularly if the criterion for testing the formula is the infant's gain in weight; for, as has been pointed out, the growth pattern of infants of different races or of opposite sexes or with different prenatal histories or with different weights at birth, etc., do not coincide and, unless these factors are controlled, we have no means of testing the formulae satisfactorily.

The above discussion furnishes an opportunity to point out an additional

factor of some significance in experimental anthropometric studies. The same gain in weight does not necessarily mean the same thing for every child, even when the children are of the same race, sex, and age. A gain of one pound in a child with a rheumatic heart, for example, and a gain of one pound in a child with a normal heart do not have the same meaning or significance. Furthermore, a more rapid gain is not necessarily synonymous with a more satisfactory gain. It is yet to be proved that optimum weight gain is synonymous with maximum weight gain. Too often this is assumed to be the case.

In this paper I have discussed problems in the fields of obstetrics, pediatrics, and roentgenology, as well as in the field of nutritional research. My only excuse for so doing is my wish to remind you that the results of research studies of children depend partly upon the characteristics of the children studied and on the methods of statistical analysis.

#### REFERENCES

1. Scammon, Richard E. The First Serial Study of Human Growth. *Am. J. Physiol. Anthropol.*, 10:329-336 (July-Sept.), 1927.
2. Boas, Franz, The Growth of Toronto Children. U. S. Bureau of Education, *Report of the Commissioner of Education, 1896-1897*, 2:1541-1599, 1898.

# Difficulties in Planning Public Health Programs in Tropical Areas\*

GUILLERMO ARBONA, M.D., M.P.H., F.A.P.H.A., AND  
PABLO MORALES-OTERO, M.D., F.A.P.H.A.

*Head, Department of Hygiene, School of Tropical Medicine; and Director, School of Tropical Medicine, San Juan, Puerto Rico*

PUBLIC health activities in the tropical areas of this hemisphere have been intensified during the past few years as a result of the recognized need on the part of the national and local governments for a healthier citizenship. Leadership which is responsible for this progress has been stimulated and developed further through Inter-American coöperation. Many obstacles and difficulties have been and are being encountered by health officials in planning their programs of work. We propose to discuss some of these difficulties, taking Puerto Rico as our point of reference because the problems of Puerto Rico are in many ways typical of these areas. Puerto Rico has had perhaps more experience in the adaptation and application of modern public health practices in a tropical environment than any other country of the Americas. One of the first orders issued by the military authorities of the Island after it became a possession of the United States in 1898 provided for a reorganization of the Board of Health and health services. In 1899 Bailey K. Ashford discovered hookworm disease to be widespread on the island, and this led to an expansion of health activities. In 1904 a Department of Health,

Charities and Corrections was created; in 1911 public health activities were concentrated under an Insular Public Health Service, and in 1917 the present Insular Health Department was organized. In 1926 the School of Tropical Medicine of the University of Puerto Rico began functioning under the auspices of Columbia University, its objectives being the study of the mental and physical ills of mankind in the tropics. Also in 1926 the first full-time local health unit was organized at the Municipality of Río Piedras, and by 1935 the 77 municipalities of the island were provided with this service. In 1940 Puerto Rico was included under Titles V and VI of the Federal Social Security Act and a further expansion of health activities took place. At present we have a modern, progressive Department of Health in charge of public health, public welfare, and insular medical care services. The total annual budget of the department amounts to \$13,500,000, of which \$5,150,000 is spent for public health work as such, a per capita expenditure for public health work of \$2.70 per year.<sup>1</sup>

For the purpose of discussion we have classified the difficulties referred to above into three main groups: those arising from existing socio-economic conditions, those from the need of more information as to the health problems, and those from the need for trained personnel.

\* Based on a paper presented at a Joint Session of the Health Officers, Laboratory, and Epidemiology Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

## SOCIO-ECONOMIC CONDITIONS

A discussion of public health problems in the tropics cannot be complete unless socio-economic conditions are considered. In this regard we may truthfully say that the economic level and the standards of living of the population in tropical areas are very low. According to a survey made by Morales-Otero and coworkers in 1937,<sup>2</sup> the average annual income for families in the sugar cane growing area was found to be \$255. Fifty-one per cent of these families reported annual incomes averaging only \$118. Another study by the Insular Department of Labor and the Work Projects Administration<sup>3</sup> of family incomes in 1941 revealed an average annual income of \$341 for wage-earner families. In comparing the economic status of wage earners in Puerto Rico and in the United States it is brought out that even the most depressed groups in the South of the United States—the Negro share-croppers and the Negroes living in rural districts off the farm—had higher incomes. Only 57.5 and 70 per cent, respectively, of these families lived on incomes under \$500 a year, as compared to 90 per cent in Puerto Rico.<sup>4</sup>

Studies made by Mountin, Pennell, and Flook<sup>5</sup> in 1935, revealed that the illness rate varies with the economic status of the population. The higher the income the fewer bed illnesses in the family. Families with annual incomes of less than \$100 showed an average annual illness rate of 444 bed illnesses per 1,000 persons; while families with incomes ranging between \$100 and \$249 had a rate of 436; for families with incomes from \$250 to \$749 the rate was 363, and families with annual incomes of \$750 or more had a bed illness rate of 297 per 1,000 persons.

A decreasing death rate<sup>6</sup> (in 1943 it was the lowest in the history of Puerto Rico, 14.7 per 1,000 population) with

a consistently high birth rate (around 40 per 1,000 population) has been pointed out to be at the root of Puerto Rico's big economic problem by Chardón, Pérez, Zimmerman, Bartlett, and other investigators.<sup>7</sup> Public health work, by lowering the death rate will continue to make our economic problem worse unless it is accompanied by some reversal in either the trend of births or in the economic potential of the island.

The problem of overpopulation exists in Puerto Rico (the density of population is 550 per square mile) and a few other of the smaller Caribbean Islands. Other countries in the American tropics however are not densely populated, yet practically all of them have the same economic problems as Puerto Rico.

It is interesting to note that in these less populated countries a high percentage of the population is concentrated in relatively small areas. In spite of great differences in population densities there is a great similarity in the age constitution of the population. For instance, in Puerto Rico<sup>8</sup> 40 per cent of the population is under 20 years of age, while in Guatemala,<sup>9</sup> with a much lower density of population, 68 per sq. mile, 50 per cent of the population is under 20 years of age. These figures may be compared with those for the United States which has a population density of 45 per square mile and with 35 per cent of the population under 20 years of age. This high proportion of persons in the younger age groups probably contributes toward a low economic level and greater health needs.

In summing up this point it may be said that in the tropical areas of America the public health worker faces the problem of greater health needs with more limited resources because of the low economic status of the people with whom he works.

NEED OF MORE INFORMATION AS TO THE  
HEALTH PROBLEMS

The lack of sufficient information on the nature of our health problems is a difficulty of paramount importance. First of all we do not know in a satisfactory way the truth about the reported causes of deaths and illness. In a bulletin published by the Pan American Sanitary Bureau containing biostatistical and epidemiological data on the Americas,<sup>10</sup> remarks are made to the effect that the accuracy of the information offered is "affected by a number of factors such as, and principally, the incompleteness of registration in many of the American republics; discrepancies in population estimates on which these notes are based, etc."

In Puerto Rico the registration of birth and deaths is considered adequate and we have been included in the United States Registration Area. A decennial census is made by the U. S. Census Bureau. However, as to the specific causes of deaths, the information available is unreliable. Mountin<sup>11</sup> found that in 1935 approximately 80 per cent of all sick persons called on a physician for treatment, but at present only 20 per cent of death certificates are signed by the attending physicians.<sup>12</sup>

Information offered by the Pan American Sanitary Bureau reveals that diarrhea and enteritis, tuberculosis, diseases of the respiratory system, diseases of the circulatory system and malaria are the five most important causes of death in the areas under discussion. The group, diarrhea and enteritis, is reported as the most important cause of death in five American tropical countries, second in two, third in two, and fifth in one; tuberculosis is reported second in two, third in one, and fifth in five; the pneumonias first in one, second in three, third in five, fourth in two, and fifth in one; diseases of the circulatory system first in one, third in three, fourth in three, and fifth in one;

and malaria first in three, second in two, third in one, and fifth in two.

The group, diarrhea and enteritis, as seen from the above data is the most important cause of death in the tropics, yet very few attempts have been made to better our knowledge as to the etiology in these cases. A few years ago a study on diarrhea and enteritis was started in Puerto Rico but unfortunately the investigations were interrupted without throwing much light on the subject. In a short note published in the Puerto Rico *Bulletin of Public Health* one of the investigators committed himself to the statement that about one-third of the deaths reported as caused by diarrhea and enteritis are due to bacillary dysentery.<sup>13</sup> Sufficient evidence was not secured to estimate the cause of the other two-thirds, but malnutrition is considered to be one of the important factors. No doubt better sanitation and better nutrition will do a great deal toward controlling diarrhea and enteritis, but in a community with limited resources where elaborate sanitary improvements may be obtained only after many years and with great effort, we need to look for simpler, easily applied methods of control which may be instituted in these communities in the meantime.

As regards tuberculosis, the available information gives us an idea of what the minimum death rates for tuberculosis are, but undoubtedly the true death rates are far higher. This disease carries with it a stigma in a large part of Latin America, and deaths known to be due to tuberculosis are often attributed to other conditions.

In Puerto Rico, where an intensive campaign against tuberculosis has been going on, the situation has changed greatly. It is suggested by many investigators that tuberculosis is more fatal in the tropics than in the temperate climates. Estimates of only 6 cases of tuberculosis per annual death



are made as compared to 10 in the United States in spite of the fact that the death rate is five times higher. In the intensive anti-tuberculosis campaign that has been carried out in Puerto Rico during the last 10 years, public health officers have had difficulties with isolation facilities. Patients are willing to be hospitalized but the number of beds available is very small in relation to the needs. Public health authorities are asking for an increase in our bed capacity from about 1,500 beds, now available, to about 4,800; that is, one bed per annual death. Extensive use has been made of ambulatory pneumothorax treatment with relatively good success. Here we have a less expensive method but it is suitable only for a certain percentage of cases. We are watching very closely the progress being made in the chemotherapy of tuberculosis, with great hopes of being able to use a less expensive method of control generally applicable.

A fact that has surprised many visitors to Puerto Rico has been the high death rate from pneumonia and the high incidence of the respiratory infections. Although no figures are available, it is the consensus of opinion among practising physicians that the common cold is the most important cause of absenteeism from schools and work. In 1935, in his illness survey of the island, Mountin found the bed illness rate per 1,000 population due to diseases of the respiratory tract to be 189 in Puerto Rico, as compared to 61 in five counties in the United States. The death rate from pneumonia, 169.7 in 1940, is more than three times higher in Puerto Rico than in continental United States. In a study of lobar pneumonia carried out by Suarez<sup>15</sup> in Puerto Rico in 1930, he pointed out that lobar pneumonia was more frequent in Puerto Rico than is usually thought, but no study that we

know of has been made to determine the true incidence and mortality from pneumonia in a tropical area. Yet the available figures indicate that it is one of the five most important causes of deaths in tropical America. No excuse can be offered for having failed to study the actual frequency and the etiological nature of the pneumonias in tropical areas when deaths from this condition can be prevented in a large proportion of cases.

The diseases of the circulatory system are increasing in importance as a cause of death while the total mortality rate goes down. A study of Suarez<sup>16</sup> of 1,081 cases of heart disease shows the four most important etiological diagnoses to be arteriosclerosis, 39.9 per cent; hypertension, 22.8 per cent; rheumatic fever, 17.4 per cent; and syphilis, 6.1 per cent. Koppish on the other hand found syphilis to be the cause in 30 per cent, and rheumatic fever in 20 per cent of cardiac cases coming to the autopsy table. The most surprising thing in this study is the high incidence of rheumatic heart disease in a tropical area where rheumatic fever is supposed to be rare. Suarez says, "It may be possible that the clinical manifestations of rheumatic fever are mild and indefinite in the tropics and the joint symptoms are either mild or absent altogether, but rheumatic heart disease is far from rare."

With regard to syphilitic heart disease there is a great discrepancy between Suarez's and Koppish's findings, probably due to the fact that Suarez's figures are based principally on private patients while Koppish's are based on autopsies. As to syphilis, which is such an important health problem and also an important etiological factor in heart disease, recent studies reveal an incidence of 12.3 per cent among selectees based on reactions to the Kahn test.<sup>17</sup> An intensive venereal disease campaign is now in progress on the island.

Malaria seems to be the most serious health problem in the rural areas of the tropics. However, in few large tropical cities of America is it reported as an important cause of death. The cost of malaria control with known methods is beyond the financial resources of most tropical countries. Great hope is being put on the use of modern insecticides which at present are being subjected to investigation, such as D.D.T.

Intestinal helminthiasis still stands out as a major public health problem in tropical and sub-tropical areas in spite of the knowledge of methods of control. It is true that quantity and intensity of infestation have been reduced through many years of campaigning. Still the problem is that of the economic impossibility of the residents of tropical countries in general to sanitize their environment adequately.

Summarizing this section, we may say that before more comprehensive and adequate health programs can be provided for tropical areas, more light is needed on the main health problems of the tropics and simpler and less expensive methods of control must be developed.

#### NEED OF TRAINED PERSONNEL

The third point to consider is the crying need for trained personnel. In this connection we wish to point out that the needs for public health personnel in tropical areas cannot be measured by the same standards as in the United States, simply because a larger percentage of the population is in need of health services. While a public health nurse for every 2,000 inhabitants is adequate in many of your counties, one nurse to 2,000 inhabitants is completely unsatisfactory for the services that would be required from her in a tropical area where the magnitude and intensity of health problems, economic resources, and education are

complicating factors. The same holds true for physicians, public health engineers, and other public health personnel.

In the tropical countries of América when we speak of public health personnel we have to think also of personnel in the medical and allied fields in general. The inadequacy of general medical care services, because of the scarcity of personnel, complicates public health programs to the point of obstruction. Medical services are unsatisfactory, especially in the smaller towns and rural areas, so that when public health agencies are organized the first problem they are faced with is the public demand for medical care, which in many instances occupies the attention and the facilities of these agencies to the detriment of the rest of the program.

There being a need for more basically trained personnel, the scarcity of specialists in the field of public health can be easily understood. There are several other factors to account for this lack. The demand has increased only recently with the development of new public health programs in the tropical areas under discussion. Also most of these countries have very highly centralized health departments which are the only employing agency for public health personnel. A person trained in public health either works for the health department or selects some other field of activity.

Another important factor is the lack of training facilities. With the exception of the School of Tropical Medicine in Puerto Rico there is no other training center for public health personnel comparable to continental schools in these areas. Training in the continent in public health does not always prepare for work in the tropics. Training is needed in an environment similar to and close to the seat of action where the person is going to work. Training

must be practical and adapted to conditions in the tropics and cannot be too expensive so that a sufficient number of workers may be trained.

Again summarizing, a need exists for trained personnel and for facilities to provide training. This need must be satisfied if public health progress is going to continue at an increasing tempo in the American tropics.

Notwithstanding these difficulties that hinder somewhat the work of public health workers, the inhabitants of these areas are rapidly becoming health conscious. There is a marked movement toward a definite goal; the betterment of the health of the people, and making the tropics as healthy a place to live in as any. In this connection, in addition to the efforts being made by the public health leaders in the different countries, great help is being received from the Pan American Sanitary Bureau; the Office of the Coordinator of Inter-American Affairs; the International Health Division of the Rockefeller Foundation; and in Puerto Rico, especially, from the United States Public Health Service and the Children's Bureau.

#### REFERENCES

1. Communication from the Department of Public Health of Puerto Rico.
2. Morales Otero, P., Pérez, Manuel A., Ramírez Santos, R., Espino, Rafaela, Ramú, A., Fuste, J. L., González, D., and Marrero, Mario. Health and Socio-Economic Studies in Puerto Rico. *Puerto Rico J. Pub. Health & Trop. Med.*, XII, 4:405-490 (June), 1937.
3. Jacobs, I. W. *Survey of Incomes and Expenditures*. Joint Survey of the W.P.A. and the Department of Labor, San Juan, P. R., 1942-1943.
4. *Puerto Rico's Economy*. Publication of the United States Tariff Commission. 1943.
5. Mountin, Joseph W., Pennell, Elliot H., and Flook, Evelyn. Illness and Medical Care in Puerto Rico. *Pub. Health Bull.* No. 237: U. S. Public Health Service, 1937, pp. 19-27.
6. *Report of the Commissioner of Health of Puerto Rico. Fiscal Year 1943-1944*.
7. Barlett, Frederic P. Population and Resources in Puerto Rico. *Puerto Rico J. Pub. Health & Trop. Med.*, XIX, 1:9-34 (Sept.), 1943.
8. *Report of the Commissioner of Health of Puerto Rico for the Fiscal Year 1943-1944*.
9. Herrera, Julio R. Estadísticas Nosológicas de la República de Guatemala, Años de 1930-1938, *Boletín Sanitario de Guatemala*, XIII, 50, enero-diciembre, 1942, pp. 65-87.
10. Martínez Rafael, H. Biostatistical and Epidemiological Report of the Americas. *Pan American Sanitary Bureau Pub. No. 195*, Feb., 1943.
11. Mountin, Joseph W. - *op cit.*
12. Communication from the Department of Health of Puerto Rico.
13. Peterson, Jerome S. News from the Acute Diarrheal Disease Studies. *Puerto Rico Health Bull.*, V, 11:386-390 (Nov.), 1941.
14. Mountin, Joseph W. - *op cit.*
15. Suárez, Ramón M. Study of Lobar Pneumonia in Puerto Rico. *Puerto Rico J. Pub. Health & Trop. Med.*, VI, 3:294-304 (Mar.), 1931.
16. Suárez, Ramón M. Unpublished report on the etiology of 1,081 cases of heart disease.
17. Costa Mandry, O., and Janer, José L. Studies on Syphilis in Puerto Rico. *Puerto Rico J. Pub. Health & Trop. Med.*, XIX, 3:483-491 (Mar.), 1944.

## March of Dimes Donations Increased in 1945

Topping last year's unprecedented donations by more than 50 per cent, the American people contributed \$16,589,874 to the 1945 March of Dimes of The National Foundation for Infantile Paralysis, as against \$10,973,491 for 1944, it was announced by Basil O'Connor, President of the National Foundation from its national headquarters at 120 Broadway, New York, N. Y.

Of the total amount of funds raised, 50 per cent is allocated to national headquarters of the National Foundation to finance research into the cure

and prevention of infantile paralysis and a broad educational program which includes scholarships and fellowships in orthopedic nursing, physical therapy, orthopedic surgery, virology and health education, as well as to maintain an emergency epidemic fund to aid County Chapters in areas hard hit by outbreaks of the disease.

The other half of the March of Dimes funds is retained by County Chapters of the National Foundation to carry on year round services to infantile paralysis victims in the 3,070 counties of the United States.

# Service Records and Their Administrative Uses

Experience from a School Health Service \*

ABRAHAM H. KANTROW, M.D., LEONA BAUMGARTNER, M.D., PH.D., F.A.P.H.A., AND HARRY H. GOODE, B.Ch.E.

*Bureau of Child Hygiene, Department of Health, City of New York, N. Y.*

EVERY administrator, particularly in a wartime period, looks for ways in which to switch his staff from less to more productive activities. Saving time in record keeping is one way of making time for other activities, but if few records are kept they must be chosen carefully and with an eye to their utility. Too frequently facts and figures are accumulated with little attention paid to their utility. The following account describes efforts of the physicians, nurses, and statisticians of the New York City Department of Health to make the most of keeping records of daily performance in the school health service.

## BASIC ASSUMPTIONS

Certain basic assumptions can be made in designing any record system.

1. Every item recorded must have some practical usefulness other than mere enumeration. An unused item has no place in a recording system.
2. Items to be used for administrative purposes should measure quantitatively accomplishment of some specifically defined procedure.
3. The procedures thus measured should relate in some clearly defined way to a stated objective of the service being analyzed.

\* Based on a paper presented at a Joint Session of the School Health and Vital Statistics Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October-4, 1944.

Stating the objectives of the service as exactly as possible is thus the first step in building a recording system.

4. The practical effectiveness and success of a form of recording is dependent upon the following factors:
  - a. Adequate field trial and opportunity for discussion and criticism by those who are to do the recording before final adoption of the system.
  - b. Training of this recording staff in how to fill in items and constant check-up to see that instructions are being followed. They should also understand to what use the recorded items will be put.
  - c. Continuous use of recorded data in interpreting to the field staff the aims and accomplishments of the service. It is only as the staff finds data useful that they are interested in keeping them accurately.
  - d. Continuing modification of form to meet changes in procedures and objectives when they occur and the removal of useless or commonly misinterpreted items.
  - e. Usefulness of recorded data for research or year to year comparisons must be limited to those data for which the definitions can be held constant, and the recording of which is known to be accurate.

## BUILDING A ROUTINE RECORDING SYSTEM

In line with such basic assumptions, the primary objectives of the school health service as currently operating were set down as follows:

1. To find those children with health problems.
2. To help these children receive that kind of

professional care (medical, dental, social service, etc.) which could be presumed would lead to amelioration or correction.

3. To make the experience with the school health service an educational one for the child, his parent and his teacher.

A next step in building the recording system was an examination of the procedures which it had been decided would be used to accomplish these three objectives. For example, in finding a child with a health problem (objective 1) the following procedures were agreed upon as most important:

1. The complete physical examination (including a good medical history) of all children newly admitted to school.
2. A yearly conference (the so-called Teacher-Nurse Conference) between teacher and nurse on the status of each child in the class, including a review of the child's medical record and a health record kept by the teacher. The latter includes semi-annual vision and audiometer tests in the classroom. As a result of this conference certain children are sent to the doctor for examination.
3. A "screening" examination by the doctor of children who the nurse or the teacher may feel have health problems.
4. The complete examination of a child who has a *definite* health problem—the so-called "specially referred" examination.

Other objectives were scrutinized in a similar manner to determine the specific procedures which should contribute to the accomplishment of that objective.

The next step was to build the specific items to be recorded. Usually answers to the following questions gave the pertinent items:

1. What has been done?
2. What has resulted from the work done?
3. What is left to be done?

For example, in building the items which should determine the effectiveness of the teacher-nurse conference these questions were asked:

1. How many classes have been done?
2. How many children are in the classes in which conferences have been held?

3. How many children were selected at those conferences for screening examination, specially referred examination, and follow-up?

4. How many classes are still to be done?

The exact items to be recorded became:

1. Teacher-nurse conferences completed.
2. Registration of class in which teacher-nurse conference was completed.
3. Children selected at teacher-nurse conference for new follow-up of a health problem.
4. Teacher-nurse conferences pending at the end of the month.

These items gave answers to the three pertinent questions about the teacher-nurse conference: What has been done? What resulted from it? What remains to be done?

Space was left on the recording sheet for five undetermined items. These could be used from time to time to record data desirable on some special occasion. This allowed special studies to be made of some particular activity without changing the entire system. Newly proposed items could be tried out for a short time to test their usefulness before adoption without setting up a special record. Such blank spaces on recording sheets allow for greater flexibility of recording and should not be omitted.

The routine items were recorded daily in the schools on a sheet with sufficient vertical spaces for one month's record, allowing for day-to-day observation of accomplishment.

The exact directions for recording were printed on the reverse of each of these sheets. Thus every recorder was constantly faced with definitions and directions, leading to greater uniformity and accuracy of recording than when instructions were given verbally in staff meetings, passed on from person to person, or even written out in a manual of procedures, usually not directly at hand when the recording was done.

In the course of building the record

system numerous meetings were held with school nurses and doctors, supervisors, health officers, statisticians, all those interested in the records in any way. Almost an entire winter was devoted to the discussion of the revisions proposed. When finally adopted one group of trained staff met with small groups of field workers, explaining the revised record, interpreting the items, emphasizing the use which they as field workers could make of the figures, etc. There were some difficulties in getting the staff to adopt the new forms, difficulties usually associated with the adoption of any new procedures. Some resented the fact that their particular suggestions were not adopted. Some clung tenaciously to old familiar ways. Others resented the fact that they were not recording *everything* they did, feeling that in some way the credit due them would not now be forthcoming. Others to whom records had always been a nuisance, looked on the new forms as merely another kind of nuisance. Obviously time spent in educating the staff about records helps overcome such difficulties. Special attention should be given to developing staff understanding of the record keeping system, and when changes are made, why they have been made.

#### USE OF THE SERVICE RECORD

The chief administrative uses to which this type of record have been put are planning the immediate program, supervising staff, finding new problems, deleting nonproductive procedures, and preparing annual budgets and reports. We shall discuss certain of these in some detail. It should be emphasized that the recording system being discussed in no way attempts to measure the quality of service given. That must be determined in other ways. But figures of this kind correctly used can be of help in improving the quality of the service.

#### PLANNING IMMEDIATE WORK

The recording system gave figures for the work accomplished and work pending. Herein lay one of its chief values. The staff had tools whereby their future activities could be more accurately planned. They knew what they had done and what remains to be done. Progress in different activities could be measured and the next month's or week's work planned. How this worked in one school can be seen in Figure 1 in which progress in three activities of the school health program for one academic year are recorded.

The abscissae indicate the successive months of the school year. The figures in each case are cumulative to indicate the progress of the work from the beginning to the end of the academic year. The ordinates indicate the work performed. It will be noticed that the scale value changes in each case because of the variation in absolute numbers to be achieved in the year.

The relationship between the scales is that derived from the average performance throughout the city. Thus in general we observed that approximately six screenings were selected per class, or four specially referreds for every six screenings. This in no sense implies that a relationship is necessarily desirable within any one school, but it gives a convenient base line. Section I indicates progress in completing teacher-nurse conferences. The program in this school was so planned that they were almost completed before the last two months of school, allowing time for follow-up of the cases selected in the conference. It will be seen that in the seventh month a considerable increase occurred. Actually this was a result of planning, for by the end of the sixth month it was evident that teacher-nurse conferences were lagging.

Section II shows the number of

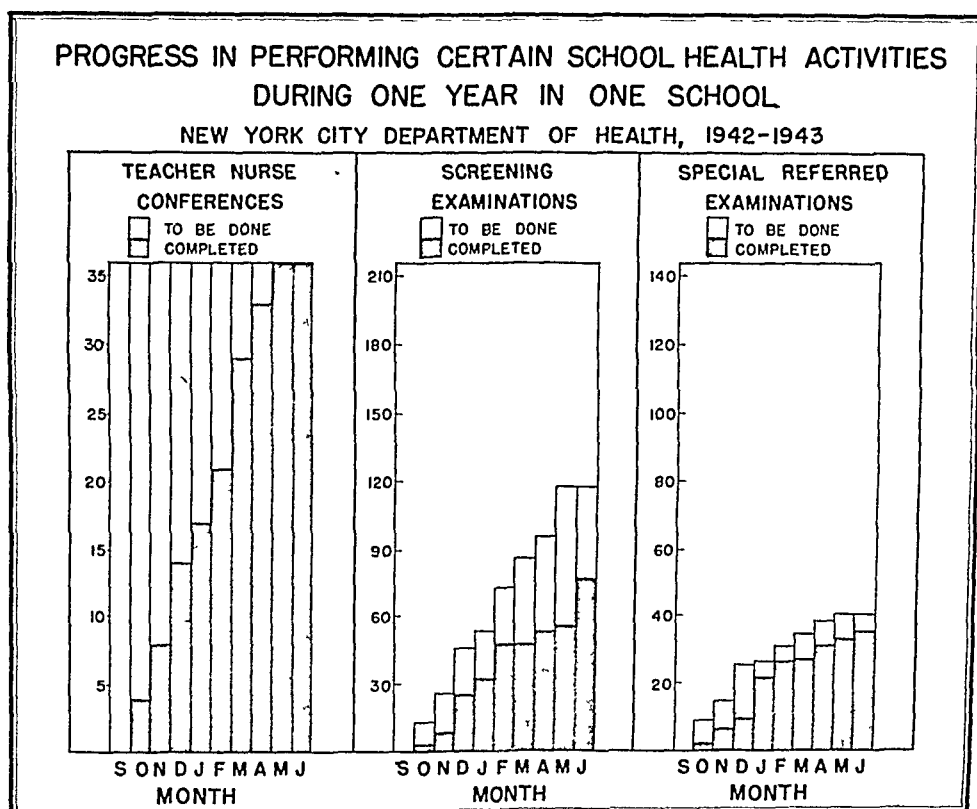


FIGURE 1

"screening examinations" to be done and the number completed each month. Obviously the work to be done piled up during the year, and though many examinations were made each month, at the end of the year some were still left to do. This fact poses a number of problems for the supervisor. Was there too little doctor's time for examinations? Was the doctor busy enough when he was there or could he have examined more children? Could more staff be assigned? Did all the cases the nurses selected actually have medical problems? Should she use a finer screen and select fewer children? All of these questions arose and, obviously, as is to be pointed out, produced material for investigation and for staff education. But let us re-emphasize that each month the staff had before them a picture of what lay

ahead, and though they did not complete their screening examinations this year, they planned to work differently the following year.

Scrutiny of Section III shows progress in completing specially referred examinations. Here the record is better, a larger percentage of these examinations was completed each month than screenings except in the first four months of the year when it was recognized that newly admitted children (not shown in Figure 1) were taking the doctor's time.

On a city-wide basis the recording system was also useful in advising staff of parts of the program that needed to be specially planned for. Sometimes danger signals were raised and could be heeded as soon as they appeared. Thus, for example, the district health officers could be warned

when the first quarter's figures were analyzed.

"Only 26 per cent of the teacher-nurse conferences have been completed. At this rate it would seem that they will probably not be completed during the school year. The range in the percentage completed in the various districts is from 14 per cent to 51 per cent, indicating a rather wide variation in program planning. If the children selected as a result of these conferences are to have medical attention during the school year, it would seem wise to reexamine the district program at this time."

The items selected also proved useful in budgeting time and work at the beginning of the school year or semester. The previous year's experience was used in estimating how much work might be done another year. When insufficient staff time was available to complete all activities, those of lesser importance could be dropped from the

semester's program, thus assuring the completion of the more important.

In the field it often became evident that the current assignment of staff was not related to the work to be done. For example, physicians had often been assigned on a routine basis of so many visits to a school each month, usually in proportion to the registration of the school. Now they could be assigned on the basis of the work which currently remained to be done in that school. Sometimes the ratio of nurse's to doctor's time was out of line with the job to be done. Most of the children, for example, who had been selected for examination, might have been seen by the doctor in one school and yet the nurse there was far behind in her classroom conferences with the teacher. If the doctor were to be assigned to the school some kind of

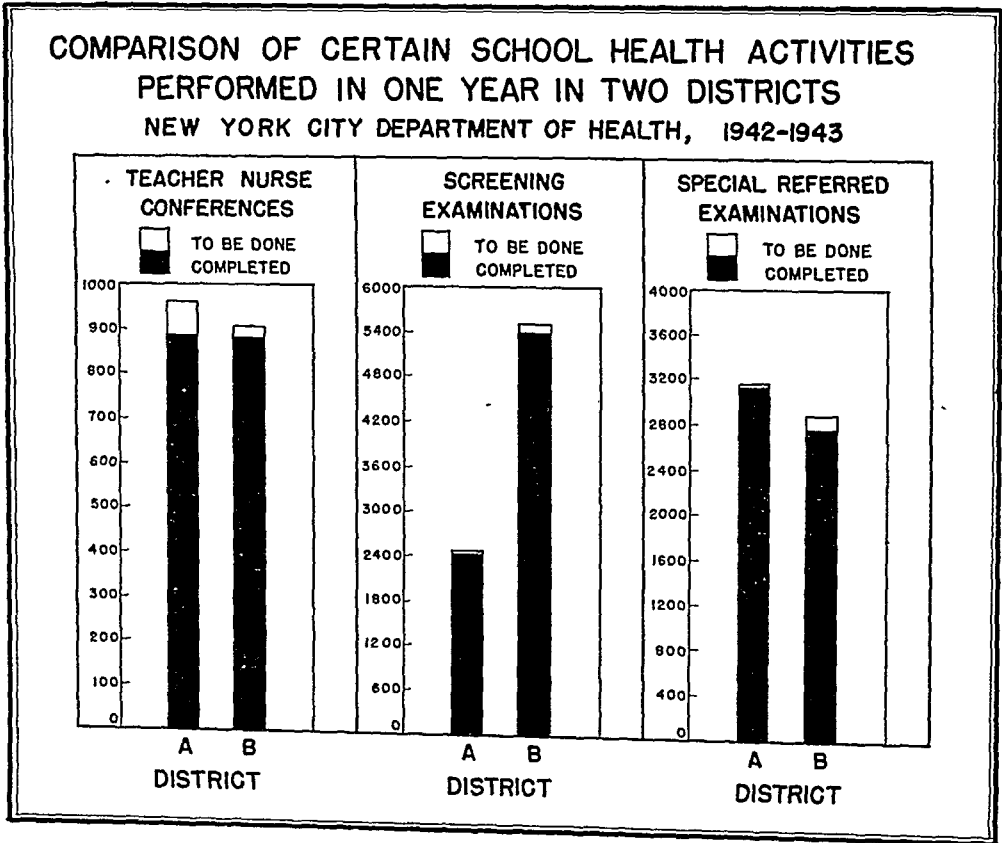


FIGURE 2



work would be found for him—to be sure—but in another school his time was desperately needed to complete work undone there.

#### SUPERVISION AND TRAINING OF STAFF

As previously pointed out, this type of recording is not designed to measure the quality of work done. Nevertheless, it may do so under certain circumstances. It points the way to spots where the job is not being done and who is not doing it, so that supervisors can concentrate on areas where help is needed. If we examine Figure 2, we see an example of this kind.

Here three activities are plotted for two districts, A and B; districts with approximately the same school population, with the same economic status of its population, districts in which there is no reason why school activities should not be quite similar. This chart is drawn in the same manner as Figure 1 except that the figures are total for the year rather than indicating the cumulative figures by months. Again the ordinates indicate the actual amount of work completed. One can see that approximately the same number of teacher-nurse conferences were completed in the two districts, although there is a slight difference in the number of those left undone. In section III, one notes that there is only a slight difference between the number of children selected for specially referred examinations and the number completed. In section II, however, one sees that in district B almost twice as many children were selected for screening examinations as in district A. Here was a specific problem for supervisors to investigate—apparently, the basis for selection was quite different in the two districts.

Supervisors also found that with specific facts on the current performance of the service and on the work that was not completed, they had ma-

terials for staff training. Moreover, the mere fact that the objective of the service had been defined in easily understandable terms and that procedures had been specifically outlined helped the staff to understand their jobs better and produced additional materials for staff training.

It is also believed that because the system was devised not by a few top administrators but with all those who were finally going to use it, rapport was improved. Focusing interest on the job to be done as indicated by the figures and not on difficulties in interrelations of staff also helped develop a new kind of working spirit, and was of assistance to those who were supervising the services. In brief, to be effective the supervisor needs good figures on staff performance, but he also needs to use the figures wisely.

In brief the supervisor has a two-fold task. The first is the guidance of the staff in the understanding and clarification of the objectives and procedures involved. The second is interpreting to the staff their progress in achieving the objectives of the program.

The question of time taken in recording such figures may be raised. Every school health service keeps some kind of service record. Most of the ones we have seen are much more complicated. In less than five minutes a day the nurse in the school can record the items we have discussed. And the staff feel that much time has been saved with the revised system because the work to be done can be more efficiently planned for.

#### DIFFICULTIES IN USING SERVICE RECORDS

There is nothing in the recording system we have just described which helped overcome the common difficulty in all such systems—namely, difficulty in the interpretation of the average or index figure. For example, the occur-

rence of an average figure of 20 per cent of the children selected at teacher-nurse conferences for the City of New York is not an indication that is a "good" or "true" figure. In our experience, there is the tendency to ascribe variations among districts or schools to some abnormality and to seek to drive these "odd" occurrences back into line instead of realizing that spread is a normal phenomenon. The causes of any variation are too frequently overlooked and a bias is thereby introduced on figures subsequently recorded by implanting in the staff a belief that the average figure is desirable.

Great care was taken, therefore, to point out that a figure which was far from average, indicated a need for investigation, but that the figure itself was not to be used as a whip. An example may make this clear. A school nurse in one of the outlying districts of the city recorded that only 2 per cent of her children were selected during the course of her conferences with the teachers. The supervisor was aware that this figure required investigation. She did not suggest that the nurse try to reach the 20 per cent city average. This would probably only have resulted in a 20 per cent selection of children. The supervisor proposed visiting the school while a teacher-nurse conference was being held. She knew that several possible conditions might exist which explain the variation. It might be necessary to correct some conditions, as, for example, the nurse might not understand the conference procedure or the teacher might not cooperate in her share of the confer-

ence and observation of children. Perhaps the economic status of the school was high so that there were actually fewer children with problems, in which case there was no condition to correct. Or perhaps, the doctor was not assigned to the school often enough so that the nurse actually selected fewer children so her file would not be "cluttered up." If so, rescheduling of the physician's time and a different kind of selection by the nurse would tend to bring the figure "into line." But at no time was it necessary or desirable to tell the nurse that she was not near the city "average" figure.

#### SUMMARY

A simple system of recording activities in the school health has been developed with the point of view of helping the field worker assay his effectiveness in attaining certain stated objectives and of giving him figures on which to plan his future work. After the objectives of the service were clearly stated, the procedures used to reach these objectives were outlined. Then a simple set of clearly understandable items were devised to answer, in general, these three questions: "What work was done?" "What happened as a result of this work?" and "What work remains to be done?" These figures so collected were of great value in planning work and training staff. The principles upon which the system was devised and the method of developing it are believed to be applicable not only to school health services in any community but to other types of public health services as well.

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35

October, 1945

Number 10

C.-E. A. WINSLOW, DR P.H., *Editor*

LEONA BAUMGARTNER, M.D., *Associate Editor*

ARTHUR P. MILLER, C.E., *Associate Editor*

MAZŮCK P. RAVNEL, M.D., *Editor Emeritus*

MARTIN FROBISHER, JR., Sc.D., *Associate Editor*

JAMES E. PERKINS, M.D., *Associate Editor*

AUGUSTA JAY, *Editorial Associate*

### Editorial Board

REGINALD M. ATWATER, M.D.

*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.

KENNETH F. MAXCY, M.D.

HENRY E. MELENEY, M.D.

ALTON S. POPE, M.D.

C.-E. A. WINSLOW, DR.P.H.

## A CHALLENGE TO THE VOLUNTARY HEALTH AGENCY

"THE voluntary health movement has had its fullest flowering in the United States. Nowhere else in the world has this type of service developed to such extent or in such variety. It is truly an extraordinary expression of the good will and neighborliness of the American people, their generosity and their genius for organization." There are now over 20,000 voluntary health agencies in the United States. They spend (exclusive of the Red Cross) some fifty million dollars a year. They enlist the active support, as board and committee members, of 300,000 public-spirited citizens. The services rendered by these agencies have, in many cases, been outstanding; and much of our phenomenal progress in public health during the 20th Century has been due to their efforts. Yet the movement—from its very nature—has been notably uneven. Many voluntary organizations are small and inefficient. Many have lagged in adapting their programs to changing social need and opportunities. Adequate correlation with the official health program has often been lacking; and the voluntary program itself has suffered from unbalance, as a result of the fact that each of its component groups has commonly been interested only in the specialized field of one particular disease.

It was this situation which led in 1941 to the launching of a study of the whole problem of the Voluntary Health Agencies under the auspices of a committee appointed by the National Health Council under the chairmanship of L. I. Dublin, and supported by a generous grant from the Rockefeller Foundation. The committee was fortunate in securing the services of Selskar M. Gunn, Vice-President of the Rockefeller Foundation, and Philip S. Platt, for many years head of the Palama Settlement at Honolulu, to conduct the study. Prof. Gunn's untimely death cut short his service, but he gave basic shape and impetus to the report and Dr. Platt has completed the task with fidelity and judgment. The investigation involved two years of field work in 65 cities and 29 states, covering 569 representative voluntary agencies and 143 official agencies and involving over 1,100 personal interviews. The final report is now before us in the form of a book of over three hundred pages.<sup>1</sup>

The report rightly concludes that "In their motivations and in their opera-

tions the voluntary health agencies represent a form of enterprise that is likely to have a permanent and valuable rôle in our civilization." Their functions are to survey needs in the health field and explore methods of meeting them; to demonstrate new and promising procedures; to educate the public with regard to health needs and health facilities; to supplement the work of official agencies with personnel or funds; to further citizen interest in maintaining the effectiveness of official agencies; to promote sound legislation in the public health field; and to stimulate coördination for the development of well rounded community health programs. "The characteristics that give these agencies their peculiar value are their origin in a commonly felt desire for better health; their ability to hold the interest of outstanding citizens; their high standards of stewardship; their ability to enlist the services of volunteer workers; their wide support by the good will of the entire public; and last, but perhaps most important, their freedom and independence."

Freedom, however, has its liabilities as well as its virtues. Indeed, the broad problems of the world today are concerned with a just balance between the two opposite essentials of planning on the one hand and free initiative on the other. Freedom, in the field under discussion "permits voluntary agencies, specifically, to undertake what is already being done by others, to undertake a superfluous task, to emphasize what interests the sponsors and to ignore what may be socially much more important." It permits a board member to say "But if we merged or went out of existence, what would become of mother's memory?" or to the president of a board to notify a newly appointed health officer that his society "would continue to be in full charge of the tuberculosis work in the community." The result in many instances is conflict between agencies, confusion of the public, an unbalanced community program and a deplorable lag in meeting emergent needs.

The remedies for these evils, suggested by the Gunn and Platt report, are essentially of two kinds, improvement in the efficiency of the individual agency and more complete coördination between the activities of different agencies. In the individual agency, failure to adjust to changing economic, social, and cultural conditions is generally due to inadequacy of the board of management or its executive. In an admirable chapter on "How to Increase Effectiveness," the report urges that each board should have three standing committees, one on Board Membership to evaluate methods of selecting and using board members so as to promote their maximum efficiency; one on an annual appraisal or criticism of the program of the organization; and one on Orientation and Training of Board Members for their important functions. The progress made by the Board Members Section of the N.O.P.H.N. is, of course, notable in the latter field and its *Board Members Manual* should be studied by all agency members. In the next place, the report points out that "the greatest weakness of ineffective voluntary health agencies is in their leadership, primarily executive leadership." It rightly stresses the vital importance of concerted effort to promote the training of candidates for this new profession in our schools of public health. There is another valuable chapter on the use of "Volunteers" in which the systematic training programs sponsored by the N.O.P.H.N. and the excellent results obtained by the New York City Health Department are cited. "To make fuller use of this great resource there should be more deliberate planning of assignment to tasks, rotation in assignments, better supervision and training on the job and systematic cultivation for more responsible functions."

The second major road to better community service involves the coordination of the individual agencies so as to further the health of the community as a whole. The most effective instrument for this purpose is the development of a health council "to coordinate as far as possible the health thinking and planning of all the organizations, public and private, concerned with public health, including, of course, the medical, dental, and nursing professions." In Cleveland, for example, the Health Council itself conducts budget hearings of all its own member agencies and is justly proud of the fact that "agencies have voluntarily reduced their requests in order that a fellow agency might have an increase and have even insisted that an agency's budget be increased over the agency's protests." The Cincinnati Health Federation is not only a coordinating and planning council for all of the 78 public and private health agencies in Hamilton County but is also an operating agency for 13 councils carrying on health programs in special fields. Such developments are, however, exceptional. Out of 55 cities visited by Gunn and Platt, 22 had no Health Council, 15 had a poor Health Council, 9 a fair Health Council, and only 8 a Council rated as good or excellent. One of the most important recommendations of the *Report* is "That every community having two or more health agencies establish a health division of the council of social agencies, or, in smaller communities, a health committee to coordinate efforts of the official health department, the voluntary health agencies, the health services of the public schools, and medical, dental, and nursing professions." Wherever the size of the area warrants, the council or committee should have its own trained executive. Similar aims to those of the health council have been attained by neighborhood health committees in Detroit, Boston, and New York City, and by state-wide public health committees in Florida and Illinois. A special chapter is allotted to the American Red Cross, whose surplus funds will probably be devoted to public health in many communities; and it is pointed out that "the success of such efforts on the part of the Red Cross chapters will depend upon their community approach, their cooperative attitude, their willingness to be one of a team and to do those things they are best equipped to do."

A brief chapter deals with state health organizations, in which field the achievements of the Committee on Tuberculosis and Public Health of the S.C.A.A. in New York and the California Tuberculosis and Health Association are specially cited.

Finally, we come to the knotty problem of the national organizations which stand at the apex of the pyramid of voluntary health agencies in the public health field. Fifteen such organizations have been intensively studied by Gunn and Platt. These national groups have rendered invaluable services in program planning, in the formulation of standards and in the preparation of educational material in their respective fields. Their work suffers, however, from the restriction of the interests of each to some particular disease or region of the body, constantly emphasized in this report. "Until the national agencies can pool their resources, at least in regard to strategic planning, so as to overcome the competitive appeals for the attention and support of the public, which is only confused by their multiplicity and diversity, they will miss the larger goals and the greater opportunities for advancing the people's health." The desire for greater coordination or unification of the national health agencies has been repeatedly voiced before our Association, by Woodward and Green in 1915, by Frankel, by Farrand and by Vincent. These early discussions led to the establishment of the National Health Council in 1921. Twenty years of this Council

have, however, shown little actual progress. "The Council has not developed leadership in important coöperative health planning that called for action; it has not brought about joint financing of national health agencies; nor has it brought the several agencies or movements any nearer unification. It has seldom spoken with the voice of authority on health matters, nor has it been, except in the early days, an effective agent in developing the health council idea on the local level." In 1936, Dublin raised once more the question of unification at the meeting of the A.S.H.A., the one organization which was actually ready for such a radical step. A survey by Hiscock in the same year concluded, however, that "radical change of fundamental organization" was hardly practicable and suggested group planning, field service, statistics and health education as fruitful lines of coöperation, aside from joint fund-raising. The Gunn-Platt report takes essentially the same position. It implies the ideal desirability of complete national unification but tacitly recognizes its impracticability and limits itself to specific recommendations for strengthening the N.H.C. along lines of fuller coöperation. It suggests reorganization of the governing board of the Council, the employment of an executive of high calibre, intelligent planning for national education in regard to health building and experimentation in regard to unification of health agencies at the state and local levels, involving two local demonstrations and one state demonstration.

A similar dichotomy between the assumed ideal and practicable attainment appears in the Gunn-Platt analysis of the problem of fund-raising. In 1945, the N.T.A. and its affiliates have nearly fifteen millions at their disposition, and the National Foundation for Infantile Paralysis, with its affiliates, another fifteen millions; while the American Cancer Society may soon also move into the big-money class. These groups depend on the Seal Sale and on individual national drives. On the other hand, groups dealing with control of diabetes, heart disease, venereal diseases, mental hygiene, maternal health, and the prevention of blindness and loss of hearing shared about a million and a half between them. This is clearly a fantastic and fortuitous distribution of resources in relation to relative needs. The *Report* concludes that "the only practical means by which the voluntary health agencies can obtain support that is adequate and at the same time related to their varying importance and needs is through pooling of their fund-raising efforts"; and it recommends that the "eight national agencies without special fund-raising devices should jointly recognize the inadequacy of their present operations and pool their appeals." Yet it accepts the fact that the N.T.A. and the N.F.I.P. will not be likely to abandon their special advantages and only suggests that these fortunate agencies broaden their programs. (Presumably, the American Cancer Society will now join this preferred class!) For the eight, or seven, less prosperous groups a national budget and a national campaign on the lines of the War Fund are suggested.

Thus, the *Report*, in essence, abandons the ideal of unification at the national level; and this is probably a wise conclusion. After all, the value of the voluntary agency lies in its freedom and initiative. If a completely unified national machine were built up on the most efficient lines it might very well lose much of this value and become scarcely distinguishable from an official agency; and the interest in particular health problems which is, basically, the driving force in voluntary health service would be lost. On the local level, the situation may be different. The *Report* concludes that "What many communities need and are ready for is *one* centralized, unified, voluntary health agency (exclusive of hos-

pitals and clinics) with one board and one executive, with special committees and staffs to direct the work of special divisions—tuberculosis, visiting nursing, mental hygiene, social hygiene, safety and so forth.” It is clearly right in recommending “in the interest of an effective national health plan, that the National Health Council be reorganized with a directing board of outstanding citizens, the strongest executive leadership, adequate service staff and ample funds to affect a wise coördination of the national health agencies and of the voluntary health movement of the country.”

Entirely sound also is the recommendation that local voluntary health agencies should be revitalized by means of:

1. Searching self-analysis, with occasional help of expert counsel, of present goals, activities, functions, methods and relationships
2. Concentrating on the task of strengthening executive and board leadership
3. Effecting coördinated health planning
4. Simplifying and unifying appeals for public support
5. Transferring appropriate activities to the official agency
6. Recognizing the primary position of leadership of the official agency and exerting influence to strengthen and support such leadership

As Dr. Dublin says in his preface, “The voluntary health agencies of the country are at the crossroads. They have grown rapidly in number, in public esteem and in resources. They must now give increasing thought to their effectiveness. The time has come when they must reorganize for the tasks that lie ahead. From now on, a more critical public will demand that its funds be used more wisely and economically; that the efforts be directed by skilled hands and that there be team play among all voluntary societies and with official agencies. The challenge must be met.”

#### REFERENCE

1. Gunn, Selskar M., and Platt, Philip S. *Voluntary Health Agencies: An Interpretive Study*. Foreword by Louis I. Dublin. Under the Auspices of the National Health Council. New York: The Ronald Press Company. Price, \$3.00.

#### CORRECTION

In an editorial on the Wagner-Murray-Dingell Bill in the August issue of this *Journal*, regret was expressed that “home nursing service is not provided in the basic insurance plan.” Our attention has been called to the fact that home nursing service *is* actually included under Section 214, paragraphs (a) and (f). Provision in Section 211 for “further study” refers only to additional nursing services beyond those specified in Section 214. The Editor apologizes for this error and suspects that some other objections against the Bill may be answered with equal satisfaction by more careful study of its actual text.

## Problems in Cost Accounting for Health Education\*

THIS committee was appointed to define the problems involved in (a) determining health education costs, and (b) relating these costs to the beneficial results derived from health education. This report reflects the composite views of committee members as compiled by the Chairman. Group discussion was, unfortunately, not possible because of travel restrictions.

Health agencies supported by public funds are properly required to budget their resources. Health education, an important activity of health agencies, costs money. A guide is needed to help us estimate the value of health education and to determine what proportion of the total budget should be allocated for it. The task is difficult because at present, health education, unlike certain other public health activities, defies measurement. One can, for example, roughly estimate the expense of a typhoid fever epidemic to a community by counting the number of lives lost, the dollars expended for medical care, the wages sacrificed by victims, and the business dollars lost because of the unsavory reputation of the town. One can also calculate the cost of eliminating typhoid fever with a fair degree of accuracy, for typhoid controlling measures are fairly well price-marked. For such a specific enterprise the health officer can make an intelligent allocation in his budget, but he has no sure ground on which to base his calculations of the value of health education. He is confronted with at least three problems, as follows:

1. *The determination of what should be designated as health education.*

For purposes of this report we may state that the aim of health education is (a) to influence the individual's attitude and behavior toward health, and (b) to mobilize public support for desirable health measures. While the tendency is to regard health education as a specialty, we believe it should permeate all public health endeavor and engage the best efforts of every member of the staff. Some of us feel that the major health education effort in any public health organization consists of the day-to-day contact with the public by all personnel connected with the health department. To a mother isolated at-home with a sick child, the public health nurse is the embodiment of the health department, and the mother's health practices are influenced by her. The proprietor of the delicatessen shop looks to the food inspector for guidance, and the inspector accomplishes more by teaching than by issuing "tickets." Popular ideas and prejudices about poliomyelitis are affected greatly by the manner in which the epidemiologist establishes quarantine measures. All this is health education and the "cost" of it is so intertwined in the daily operation of the department that no accountant could segregate it.

Obviously, it will never be possible to set up an accounting sheet if health education is interpreted thus broadly. Therefore it becomes necessary first to delimit and define those operations of

---

\* Report of the Committee.  
COMMITTEE ON PROBLEMS IN COST ACCOUNTING FOR HEALTH EDUCATION.  
Organized 1943.



the health organization which are to be officially designated as "health education." Such delimitation will necessarily be a very arbitrary one and it must take into consideration numerous exasperating questions, as for example: Shall health education, for accounting purposes, be limited to the specific activities of the health education bureau? Shall we add to the cost of every public health project a given percentage of the total (as business concerns commonly include the item "light, heat, and power" in every cost calculation)? When the director of child hygiene sits in conference with the county medical society, when the sanitary inspector issues a court summons, when the laboratory technician sounds a warning that a bathing beach is polluted—should parts of these costs be allocated to health education? These are difficult questions. If we wish to appraise health education, we must first of all agree upon what it is, that is, what shall be included and what shall be excluded from our cost sheets; otherwise they will not be comparable.

The committee recommends, therefore, that a definition of "Health Education for Purposes of Cost Accounting" be formulated and adopted.

2. *A second problem*, which must be met before any sound system of cost accounting can be devised, *is to formulate values or measurements whereby the results of health education may be appraised.* On first blush such an attempt seems preposterous. No one has yet been able to measure the results of education of any kind, except that of a strictly technical nature. The best reward any educator can ever hope for is to chance occasionally upon an arrow in an oak that was more or less aimlessly shot into the air. How can we know that a radio talk on appendicitis, delivered in 1944, will cause a listener in 1950 to hurry to a surgeon

because he has a sharp pain in his right lower abdomen? How can we establish that it was our leaflet which created an increased demand for salads? What proportion of the changed attitude on sex is the result of 30 years of purposeful social hygiene education? The forces which influence human behavior are so subtle, volatile, and elusive, and yet so powerful, that one cannot possibly trace the real effect of a given educational effort.

The committee is loathe, however, to admit complete defeat, and would encourage the search for measuring devices which will at least reflect the general effect of the health educator's efforts. We take courage from the ambition of the astronomer who has devised methods for weighing and measuring stars and planets billions of miles away. Bauer and Hull, in *Health Education of the Public*, have suggested "twenty-five criteria of health progress in a community, to which health education has contributed (and which) may be used as a crude measuring stick of the influence of health education." Other adventurers also have undertaken to measure results in limited and specific projects (see bibliography) which encourage the hope that the estimation, if not the measurement of results, is feasible.

One wonders, however, whether the effort may not defeat its own purpose. There are dangers involved in suggesting procedures that have the semblance of precision. Many workers are all too eager to substitute the slide rule for the cerebrum. Moreover, reliance on mechanistic substitutes for intelligent observation and intuitive impressions, may be misleading. And there is danger that the aspirations and enthusiasm of the health educator may be stultified if his faith—his belief in what he is doing—is challenged by what purports to be a balance sheet.

With these reservations, and with

considerable trepidation, the committee recommends that a study be made of the various criteria thus far proposed for measuring the results of health education, in the hope that some practical means of measurement may eventually be discovered.

3. *A third problem is to standardize the technic of figuring the costs of production of health education materials and the costs of services.* The basic costs that enter into the creation and distribution of a booklet, for example, may include the paper, printing, illustrations, binding, packing, carriage, etc. These are definite costs, easily ascertained. But there are also the costs of the labor of the writer, the secretarial staff, office overhead, administrative supervision, and other items which surely add to the costs of the booklet and which vary widely for different types of printed matter. It may be difficult but not impossible to find a formula for estimating these costs. More difficult is the task of fairly accounting the costs of a motion picture, and still more elusive is the job of evaluating the labor costs involved in making an address or a radio talk.

Two members of the committee have volunteered to coöperate in preparing accurate cost estimates of actual material already produced by the organizations which they serve. If others could be induced to make similar studies the results of the several collaborators might be pooled and out of the joint study it is conceivable that a standard method of estimating costs of production and of performance might be devised which would be serviceable to the entire public health profession.

#### SUMMARY

The committee recommends that the Section on Public Health Education:

1. Define "Health Education for Purposes of Cost Accounting."
2. Conduct studies of criteria which have been proposed to evaluate the results of health education.
3. Standardize methods of computing the costs of producing health education materials and of rendering health education services.

NOTE: For the bibliography of articles and books dealing with the subject of health education costs, the committee is indebted to the National Health Library.

\* H. E. KLEINSCHMIDT, M.D., *Chairman*,  
300 Fourth Ave., New York, N. Y.  
SAVEL ZIMAND  
BEATRICE HALL KNEELAND  
EDNA A. GERKEN  
LEONA DE MARE EAST  
WARREN H. SOUTHWORTH, DR.P.H.  
MARION MCKINNEY  
THOMAS G. HULL, PH.D.  
DONALD A. DUKELOW, M.D.

#### HEALTH EDUCATION—EVALUATION AND MEASUREMENT OF RESULTS

- Armstrong, D. B. *Health Education: An Appraisal. J.A.M.A.*, 117:2060-64 (Dec. 13), 1941.
- Bauer, W. W. Can Results of Health Education Be Measured? *Bull., N.T.A.*, 23:163-65 (Nov.), 1937.
- Bauer, W. W., and Hull, T. G. *Health Education of the Public; a Practical Manual of Technic.* 2d ed. rev. Phila.: Saunders, 1942. 315 pp.
- Bent, M. J., and Greene, E. F. *Rural Negro Health; A Report on a Five-year Experiment in Health Education in Tennessee.* Nashville: Julius Rosenwald Fund, 1937. 85 pp.
- Clarke, Walter. Public Health Education—Has It Succeeded? *J. Soc. Hyg.*, 26:145-51 (Apr.), 1940.
- Coleman, B. S. Health Education Gauged by Results. *Bull. N.T.A.*, 26:151-52, 154 (Oct.), 1940.
- Derryberry, Mayhew. Measuring Achievements in Health Education. *Hygia*, 12:1132-33 (Dec.), 1934.
- Greenleaf, C. A., and Grout, R. E. Evaluation of a Rural School Health Education Project. II. A Study of the Effectiveness of a Rural School Health Program in Improving the School Environment. *Milbank Mem. Fund Quart.*, 16:156-72 (Apr.), 1938.
- Greenman, R. H. Incentives and Methods in Health Education—Adult Level: The Medical Society View. *A.J.P.H.*, 30:1211-16 (Oct.), 1940.
- Grout, R. E. Appraising a School Health Education Program. *A.J.P.H.*, 30:797-805 (July), 1940.
- Hardy, M. C., and Hoefler, C. H. *Healthy Growth: A Study of the Influence of Health Education on Growth and Development of School Children.* Chicago: Univ. of Chicago Press, 1936. 360 pp.
- Hiscock, I. V. Community Health Education. *A.J.P.H.*, 30:516-22 (May), 1940.
- Hardy, M. C. Research in Evaluation. In *A.P.H.A. Public Health Education Section. Seventh Institute on Public Health Education.* 1940. pp. 68-78.
- Horwood, M. P. Can a Community Health Education Program Be Appraised Objectively? *Massachusetts Health J.*, Mass. Tuberculosis League, 23: 11, 13-15 (Jan.-Feb.-Mar.), 1942.

Lamkin, N. B. *Education for Healthful Living in the Public Schools of Bellevue-Yorkville, 1927-1931*. New York: Bellevue-Yorkville Health Demonstration, 1933. 58 pp.

Lewis, D. J. The Effectiveness of Public Health Education from the General Physician's Point of View. *Illinois M. J.*, 63:33-37 (Jan.), 1933.

Little, C. C. Indications of Progress in Cancer Control through Education. *Bull. Am. Soc. Control Cancer*, 23:2-3 (Nov.), 1941.

Palmer, G. T., and Derryberry, Mayhew. Appraising the Educational Content of a Health Service Program. *A.J.P.H.*, 27:476-80 (May), 1937.

Payne, E. G., and Gebhart, J. C. *Method and Measurement of Health Education; An Experiment in Public School 106, Manhattan, New York City*. New York: Association for Improving the Condition of the Poor, 1926. 43 pp.

Richardson, B. K. The Value of Public Health Instruction and Public Health Work as Seen by the Public Health Official. *Illinois M. J.*, 63:41-56 (Jan.), 1933.

Schiffes, J. J. Involuntary Suicide—More Deadly than War. *Hygeia*, 22:590-91, 610, 612, 614 (Aug.), 1944.

Smith, L. M. End-results of Health and Physical Education. *J. Health & Phys. Educ.*, 3:14-15, 56-57 (Apr.), 1932.

Sundwall, John. How Effective Is Health Education in the College? *Tr. N.T.A.*, 1943, pp. 266-85.

Turner, C. E., and Marshall, F. G. Health Education and the Prevention of Tuberculosis. *J. Outdoor Life*, 31:290-91 (Aug.), 1934.

Turner, C. E. *Principles of Health Education*. 2d ed. Boston: Heath, 1939. 335 pp.

Winslow, C.-E. A. *The School Health Program*. New York: McGraw, 1938. 120 pp.

## Cleveland Health Museum Expands

Trustees of the Cleveland Health Museum have approved plans for purchase of the building formerly known as Garfield House, 8917 Euclid Avenue, occupied by the Cleveland Speech and Hearing Center. The new property, it is announced, will be used to accommodate the Dickinson collection of sculptural models of human reproduction recently acquired by the Museum. It will augment space for other existing exhibits and for new exhibits planned to cover mental hygiene, industrial health, and a new series pointing the way toward a healthier and happier old age. It will furnish additional space for the health education laboratories, particularly the new plastics department, and give increased facilities for teach-

ing in the postgraduate field of health education.

The newly acquired property consists of 2 5/6 acres. The principal building is a terra cotta stone and brick structure of 39 rooms on four floors, including the basement. The property includes another large frame building, and large parking space is included.

Acquisition of the property, according to Dr. Bruno Gebhard, Director of the Cleveland Health Museum, was practically obligatory because of requests for health educational aids constantly made of the Health Museum. The expanded facilities will make it possible for the Museum to coöperate increasingly with schools in the ultimate development of a Junior Health Museum.

## Credit Lines

### This Is Now a Post-war World

The so-long-hoped-for but hardly-yet-expected end of World War II inspired Credit Lines Editors to view their accumulated mail from the perspective of a post-war world. What with paper and personnel shortages, there is not as much as one might hope, but one can find straws in the wind even though the material on our desk was prepared when the prospect still looked like a long war ahead. Samples of planning, of labor and welfare activities, news out of Europe, discussions about a national medical care program, and a series of public affairs pamphlets are presented to readers in the hope that they may kindle the imagination.

#### PLANNING

MONTREAL—Aimé Cousineau, C.E., F.A.P.H.A., sends us "Planning for Montreal," a preliminary report of a master plan by the Department of Planning, of which Mr. Cousineau is the Director. Among the technical advisers is Dr. Adélaré Groulx, Health Officer of Montreal and A.P.H.A. member.

MARYLAND—"Ten Years of State Planning," the report of the Maryland State Planning Commission, is prepared in terms of objectives and accomplishments. Absolutely and relatively, in view of the fact that the average annual 10 year appropriation by the State Legislature has been \$5,200, the extent to which objectives have been achieved is remarkable. The Chairman throughout the ten years of the life of the Commission has been Dr. Abel Wolman, Fellow of the A.P.H.A. and Chairman of its Executive Board. Dr. Robert H. Riley, Maryland Health Commissioner and also a Fellow of the Association, is another member.

Among the objectives not yet achieved in public health administration is an advisory health council in each county. Maryland has a full-time health department in each of its 23 counties, a distinction which it shares with only a few other states.

BOMBAY—We are indebted to the *S.C.A.A. News* for a note about "the Bombay Plan" prepared by industrialists and business men and having widespread discussion as something new in economics and social welfare for a country as densely populated and with such low living standards as India. It proposes to double the per capita income in 15 years, raise the standard of living of the masses, and improve social services. It sets 2,800 calories of well balanced food as a minimum and 100 square feet of housing for each person.

#### HEALTH AND WELFARE SERVICES ON THE LABOR FRONT—RANDOM SAMPLES

HEALTH COUNCIL—"We move fast once we are convinced that a cause has merit." The truth of this quotation from the *Health Council Digest* of May, 1945, is made manifest by the many activities of labor in the field of health security. Labor participation in what are broadly called community welfare services hardly dates back further than the early days of the presently concluded World War. Yet the *Health Council Digest*, the official publication of the Health Council, an American Association of Health Workers for the promotion of labor health security, education, and legislation, sponsored by the American Labor Party and trade unions, is already in its second year. The May issue, for example, discusses the seven basic essentials of a people's health security program and has other

articles discussing Mayor LaGuardia's health insurance plans and labor's participation in public health and industrial hygiene. The column "What to Read," includes thumbnail reviews of such books as Dr. Stern's *American Medical Practice in the Perspective of a Century*, Kaempfert's *What About the Doctors?* as well as the annual reports of the Federal Security Agency, U. S. Public Health Service, and other relevant technical material. Also at hand is the report of the Second War-Time Conference of the Health Council, held in December, 1944, the primary objective of which was "to formulate methods of dealing with problems of health protection for the American people in the post-war world."

**NORTHERN CALIFORNIA UNION HEALTH COMMITTEE**—Also on the desk of the Credit Lines Editor is the July 1, 1945, *News Letter*. (Vol. 2, No. 8) of the Northern California Union Health Committee, "a Committee working with all labor, health, and medical groups to improve the health and safety of organized workers in Northern California." This is the area, if anyone needs to be reminded, of great naval installations, troop embarkation services, war production of all kinds, including the Kaiser shipbuilding which has created a ferment not only in production but in health and welfare services as well. This issue summarizes national and California health legislation passed or defeated by the recent legislative sessions. It reports on union participation in an industrial safety conference in Oakland.

**CIO COUNSELLING**—This brochure tells about a new service of CIO members to each other—a non-professional counselling service designed to acquaint workers with community health and welfare resources. The program, adopted as an international union policy by the 1944 UAW-CIO convention, grew out of a joint survey in 1943 by

the CIO and the War Production Board into absenteeism in Detroit war plants, which in some instances was as high as 20 per cent. This investigation revealed what is called the "obvious"—housing, sickness, legal, and the thousand-and-one confusing problems imposed by life in a war-crowded and over-strained community as the causes for absenteeism.

The counselling program calls for the training of key workers in the plant, not in the professional techniques of social service, medical and otherwise, but rather in the knowledge of community resources for dealing with various problems. Meeting the problems, therefore, can be no more effective than the community's effectiveness. However, the authors say significantly, "CIO members are contributing large amounts to the support of private health and welfare services through war chest and Red Cross campaigns and public (federal, state, county and municipal) health, welfare and public assistance services through taxes. There is every reason why they should use the services fully when they need them. . . . There is every reason, too, for the union to find out what new services are needed in the community of which its members are citizens. Or if a community agency is falling down on the job, the union should find out about it and take whatever action is necessary to get the service improved. The CIO counselling program enables the union to do both."

Among the first 1,000 cases referred by Detroit counsellors to community agencies, 45 per cent were to housing agencies and 10 per cent to health agencies.

#### SOCIAL WELFARE NEWS OUT OF CENTRAL EUROPE—ROUMANIA

The OWI sends out from the Roumanian Director of Social Welfare, Christina Galitzi Bratescu, a brief

summary of the three Institutes of Hygiene in Roumania which have been started, thanks to the collaboration of the Health Department, the Faculty of Medicine, and the International Division of the Rockefeller Foundation. The Institute in Bucharest was founded in 1926, the one at Iassy in 1930, which has been carrying out investigations on scarlet fever and malaria, and one at the University of Cluj also in 1930, with a rural experimental station.

The author includes a summary of the special emergency relief program of Moldavia and Northern Transylvania, and a history of social work and public welfare in Roumania. Of the third period, 1919-1940, of this development the author says, "For the first time both private initiative and the state put the emphasis upon prevention and the safeguarding of public health." Also included is an analysis of seven of the social and health agencies of the country.

The material, quaintly translated into English from the original, is among the first that has come out of Roumania since the war. It shows how much American workers have influenced the development of social services in Roumania during both world wars.

#### BANKERS DISCOVER MEDICAL CARE

The Summer, 1945, number of *The Index*, a quarterly of the New York Trust Company, devotes 15 of its 26 pages to a two part article on socialized medicine. Except for its assumption that compulsory health insurance is synonymous with federal control of medicine, its acceptance of the thesis that a government system of medicine *per se* renders a substantial service and its far too glib use of the term "socialized medicine," the article studiously avoids the shrill screams that so often pass for arguments against the extension of the social insurance principle to include medical care. Nor is

the article wholly committed to the traditional AMA policy with respect to a national medical care program. It asks significantly, "Is medicine in the same position that education found itself a century ago—moving from a private to a public field?"

#### PUBLIC AFFAIRS PAMPHLETS, ABOUT VETERANS AND CURRENT MATTERS

*Straight Talk for Disabled Veterans*, by Edna Yost in collaboration with Dr. Lillian M. Gilbreth, assures wounded veterans that their earning capacity need not be impaired even by serious disability, nor need they lose out socially, or with the girl back home, but that success does not come without effort. It is a plea to the disabled veteran to be himself and to assume he can do any job for which he is otherwise fitted.

Earlier in the year *Veterans Guide*, by Dallas Johnson, was published. This is a simply worded story of the discharge procedures, the GI Bill of Rights and the agencies, both official and unofficial, that can help in education, job getting, borrowing money, buying a house or farm, medical care, and other problems. The veteran's own responsibility for his future is stressed as well as the community aids.

These and seven other pamphlets published during 1945 epitomize neatly the outstanding post-war problems. The story of Blue Cross and Health Care for Americans have already been mentioned in the *Journal*. Agriculture is represented by Carey McWilliam's *Small Farm and Big Farm*; the form of business organization in the future is discussed in Thurman Arnold's *Cartels and Free Enterprise*; job security is the theme of Maxwell Stewart's *There Can Be Jobs for All*; race relations, of Alfred McLung Lee's *Race Riots Aren't Necessary*; and the rising generation, of Alice C. Weitz's *Youth and Your Community*.

## THERE'S GOLD IN THEM THAR HILLS

Ruth J. Frantz, a member of the American Public Health Association and Director of the Bureau of Health Education of the West Virginia State Department of Health, for her recent thesis for the degree of M.P.H. from the University of Michigan School of Public Health, made an analysis of health education material found in the *American Journal of Public Health*.

Beginning with the Abstracts of Proceedings in 1873, and following through to the current editions of the *Journal*, Mrs. Frantz has analyzed 206 articles, covering some 1,275 pages, with growing emphasis upon the subject indicated in more recent years. The author has been able to group the articles into a number of categories: objectives, content, methods, audience and professional leadership and she analyzes trends of health education material in these categories over the years.

This is an interesting illustration of the fact that browsing in or studying earlier issues of the *Journal* is richly rewarding. They are a mine of historical perspective, as well as of currently relevant information, for workers in the various phases of public health.

THE HISTORY OF TUBERCULOSIS  
PREVENTION

"Antecedents of the National Tuberculosis Association" by Robert G. Paterson has just been published as No. 2 in the historical series of the Committee on Archives of the National Tuberculosis Association. The first in the series, a symposium of historical papers, was published in 1942 under the title "Past and Present Trends in the Tuberculosis Movement." The series is designed to record in permanent form the background and history of the National Tuberculosis Association, the tributary movements that flowed into it, as well as the activities that had their origin in its inspiration. When

completed the series should be the definitive story of the converging movements to wipe out tuberculosis in this country and of the personalities who wrote the story in action.

## "D-DAY AGAINST TB"

Under this title J. C. Furnas writes of tuberculosis prevention in the April, 1945, *Ladies Home Journal*. "If the public knew widely enough what enough beds, enough case finding, and enough rehabilitation could do, the TB menace would now be in the same boat that the Nazi menace was in when the Allies went ashore in Normandy on D-Day." And he marshalls his words and his facts so that the public will know that a calf gets better breaks than a baby, that one day's cost of war would provide an adequate number of sanatorium beds, and that to prevent tuberculosis costs only about a tenth the cost of the disease. Fifty thousand reprints have been distributed by the National Tuberculosis Association to state and local associations.

TWELVE YEARS OF THE COLUMBIA  
COUNTY (N. Y.) HEALTH  
DEPARTMENT

The 1944 *Annual Report* of the Columbia County Health Department indicates a decreasing death rate and an almost complete absence of deaths from communicable diseases. The infant mortality rate in 1944 was almost half of the 1943 rate. The report also outlines some post-war plans for employing a dental hygienist and extending the dental health program, for rehabilitation of veterans, and for improvement of post-war housing through building codes.

The Columbia County Health Department is the fifth of the six full-time county health departments organized under New York's permissive laws of 1921, and one of two with populations of less than 45,000. Nassau, organized

in 1939, is the most recent full-time county health department in the state.

#### PUBLIC HOUSING PAYS DIVIDENDS

The Housing Authority of the City of Newark has been publishing a series of illustrated pamphlets of a high order of public education in the philosophy of public housing. The latest, dated April, 1945, gives the figures of savings due to public low-cost housing in the cost to the city of illness, accidents, and fires. In 1944, this saving was about six times the tax exemption. "Instead of losing money, a community gains by providing its citizens with good homes."

#### WHAT MAKES A NATION GREAT?

"Education—A Mighty Force," a pamphlet of the National Education Association, comes dressed in a cover of rich gold and royal purple, which note is carried out in the paper and typography. The theme song is that people make a nation great, that education in the broadest sense makes a people, and that the core of education is the inspired, imaginative, and resourceful teacher, who, it points out, cannot be bought for \$11.50 a week, which is what five out of every 100 teachers were paid in 1943-1944—or even \$23 a week to which 30 out of every 100 could not aspire.

#### TELLING THE COMMUNITY ABOUT THE HEALTH DEPARTMENT

The Norman City, Cleveland County, Oklahoma Health Department sends an interesting illustration both of its integration with the life of the community and of its initiative in telling its story to the public. *The Cleveland County Health Review*, prepared by the Health Department staff, under the direction of Gertrude Nielsen, M.D., Health Officer, is a special four-page section of the Community newspaper, the *Norman Transcript*, of Sunday, May 27. In pictures, text, and statistics, it tells

this community of nearly 30,000 how its local health department works.

Among the items discussed are the new dental health service, the activities of farm women in promotion of health, the rapid treatment center for V.D., the new hospital appropriation, mass x-rays, malaria control, care of crippled children, the growing importance of chronic diseases, and coöperative personnel and other arrangements with the naval hospital in the area.

The articles all sound as though the health workers had taken a view of the wide horizons of Oklahoma and the nation rather than being close-cabined within the 600 square miles of Cleveland County.

The statistics show that for a per-capita cost of \$1.08 a full-time medical health officer was provided, as well as seven public health nurses, two sanitary workers, a health educator, a dental hygienist, and two clerks.

Incidentally, the cost of printing the quarterly bulletin of this department is the Norman Chamber of Commerce's contribution to community health service.

#### LIGHT FOR THE GREAT DARKNESS (by Raymond S. Patterson, Ph.D.)

In the Annotated Bibliography section of the *May Journal* was a reference to an outstanding paper "The Problems of Cancer Biology." In the annotation I admitted my complete incompetence to comment on the paper the reading of which left in me a profound respect for those who are groping their way in this dim-lit region, but the reading left me with not much else. Out of the kindness of his heart, Dr. R. R. Spencer, author of the paper, sent me a brochure to help me dispel a little of my ignorance. "Breast Cancer" is the name of the leaflet.

Not often can anyone say without qualification to all health educators—and this means all health workers—



"Here is just what you need," but about "Breast Cancer" it can be said: It is adult and it is honest. It assumes that the reader may have passed the "I see the cat" level of education. It doesn't gloss over hard facts, there is no whimsy and no gladsome tidings. It gives useful, particular advice to women and persuades them to follow the advice. And *that* is good health education.

The best news is that "Breast Cancer" is only the first of a series of pamphlets each of which will discuss cancer of some specific site. The next one will be about cancer of the uterus. Health workers can obtain limited amounts of these booklets free from the National Cancer Institute, Bethesda, Md. Larger quantities can be purchased from the Government Printing Office for \$1.25 per hundred, and that is a bargain.

#### DENTAL HEALTH EDUCATION IN NEW JERSEY

*Healthy Teeth for Our Children: Four Study Outlines for Parent Education Groups*, published by the New Jersey State Department of Health, Trenton, N. J., concerns itself with the prevention of dental disease. It was prepared by the State Chairman of the Congress of Parents and Teachers, assisted by state members of the New Jersey College of Agriculture, with the advisory service of Dr. J. M. Wisan and his colleagues in the State Bureau of Dental Health, and was based upon material previously prepared by the Department of Education.

#### WORTH LISTENING TO

A series of radio programs broadcast to the medical profession under the title "The Doctors Talk It Over," sponsored by Lederle Laboratories, Inc. The program can be heard nationally on Friday evenings. Local papers should be consulted for station and time. Reprints of current series are individually

available by addressing Lederle Laboratories, Inc., 30 Rockefeller Plaza, New York 30, N. Y.

Incidentally the first series broadcast from October 6, 1944, to March 30, 1945, has been published in a 214 page book by Lederle Laboratories and copies are available on request to the above address.

Both series were written by Mr. Irve Tunick who will be remembered as radio impresario for the Association's First Wartime Public Health Conference in New York City in 1943.

#### ANOTHER GOOD ANNUAL REPORT

"The American Social Hygiene Association Reports for 1944" is a brief and interesting annual report of the expanded wartime services of this organization. Its illustrations and layout are attractive and informative.

#### PARENTS, CAN YOU PROVE WE ARE YOUR OWN?

The Children's Bureau and the Census Bureau distribute a number of reminders for 100 per cent registration of births. The 1945 Child Health Day Slogan was "A Birth Certificate for Every Baby Born in the U. S." For general distribution is "Why Register," an attractive little folder graphically illustrated in red and white, with appealing figures in all the situations in which a birth certificate is important. The illustrations are contributed by N. C. Jackson of the Ohio Department of Health. Another item is a map of the United States showing the extent of birth registration. This shows that more than half the states have some areas in which birth registration is less than 75 per cent complete.

#### WORTH ACQUIRING

*UNRRA: Organization, Aims and Progress*—An information pamphlet giving a comprehensive description of the scope and functions, organization

and principal fields of operation of UNRRA for use by teachers, discussion leaders, and students of international relations. Free. United Nations Relief and Rehabilitation Administration, 1344 Connecticut Avenue, Washington 25, D. C.

*The Rochester, Minnesota, Child Health Project*, by Agnes E. Meyer—An outline of a community project in child health, in its broadest sense, organized coöperatively by the Mayo Clinic and the University of Minnesota Medical School and Child Welfare Institute. Originally printed as a series of articles in the *Washington Post*, it has been reprinted by and is available from the Children's Bureau, Washington, D. C.

*Trends in Longevity*, by Louis I. Dublin and Alfred J. Lotka—Not only are there "sermons in stones and running brooks," but also in statistics. Reprinted from the January, 1945, *Annals of the American Academy of Political and Social Science*, Philadelphia, this article relates longevity to living standards and to medicine and public health administration, which in turn are related to economic and political climate. The contrast between India, for example, and New Zealand is full of meaning.

Two Nutrition Bibliographies—*Bibliography of Foods, Nutrition and Nutrition Education* was prepared by the Minnesota Nutrition Council and is available from the Hennepin County Chapter, American Red Cross, 325 Groveland Avenue, Minneapolis 4. The material dealing with the nutrition of children is classified for parents and teachers and by age groups for children. *Selected Food and Nutrition Publications* was prepared by the New York City Food and Nutrition Program, 45 Lafayette Street, New York 13, and sells for 25 cents. The rural and urban emphasis respectively results in surprisingly little duplication in the two pamphlets.

Public Affairs Packet on Jobs and Security—The Public Affairs Committee, 30 Rockefeller Plaza, New York 20, for 75 cents offers the 300 page Beveridge Report, *Social Insurance and Allied Services*, the American edition of which it is the exclusive distributor, and four Public Affairs pamphlets, *The Beveridge Plan*, *Jobs and Security for Tomorrow*, *Health Care for Americans*, and *There Can Be Jobs for All*.

*Methods of Testing and Protecting Eyesight in Industry* is No. 4 in the industrial health series of the Metropolitan Life Insurance Company from the New York, San Francisco and Ottawa offices of which it may be secured without charge.

Officially "Home Room 3" is the exciting story of a group of problem boys in Cincinnati who have been converted from truancy and incipient delinquency to responsible citizens by running their own shoe shine, cleaning and repair shops. In *Education for Victory* 3:14 Jan. 20, 1945.

*Facts for Action*, the quarterly of the Los Angeles County Tuberculosis and Health Association, 117 West Ninth St., Los Angeles, Calif., is now in its sixth issue (June, 1945). In some recent issues it has had a story of school case finding in Los Angeles and a dramatic analysis of local statistics of tuberculosis deaths.

*No Rats—No Typhus* is a four page leaflet with illustrations of "the rat that carried the flea that bit Jack" who lies there pushing up daisies. The Houston City Health Department, Houston, Tex., is distributing 65,000 in its educational program in public schools.

*Juvenile Guidance—A Plan for Action* is an attempt to suggest a program on a community level to stem the rising tide of juvenile delinquency. Congress of Parents and Teachers. (Believe it or not, it gives no hint of where it is located, perhaps you know.)

*Your Baby Needs Cod Liver Oil*—A display poster and a pamphlet by the Mississippi State Board of Health, Jackson, Miss.

*She Looked Clean But . . .* is a pamphlet distributed by the Social Protection Division of the Office of Community War Services, Washington 25, D. C. All about how the "good-time" girl can get the service man as well as lots of other people into trouble. It doesn't pull its punches for the prurient and it is dignified and honest as well.

*The Story of Blue Cross—On the Road to Better Health*, by Louis H. Pink, President of the Associated Hospital Service of New York and former Superintendent of Insurance of

New York State, finds that the public wants its doctor bills prepaid as well as its hospital bills, wants preventive as well as curative service, and favors the gradual and sound extension of social service. This is No. 101 in the series of popular factual ten cent pamphlets published by the Public Affairs Committee, Inc., a non-profit educational organization at 30 Rockefeller Plaza, New York 20, N. Y.

*Medical Care for Everybody?* by Maxine Sweezy, is a discussion pamphlet on the same subject, includes a bibliography, and is available from the American Association of University Women, 1634 I Street, N.W., Washington 6, D. C., 15¢.

---

## Cancer Education

The Metropolitan Life Insurance Company is conducting a special cancer education campaign during October to encourage diagnosis and treatment earlier in the course of the disease, especially among women. The company's more than 20,000 field representatives, in coöperation in many communities with official and voluntary agencies, will distribute to practising physicians a special packet of new information on cancer. Included will be the American Cancer Society's booklet, *The General Practitioner and the Cancer Patient*; a reprint of recent studies of cancer mortality prepared by the statisticians of the Metropolitan;

a reproduction of the company's educational advertisement on cancer, *Cancer Has Its Hopeful Side!* appearing during October in national magazines with a combined circulation of about 30,000,000 readers; and a copy of the company's new leaflet for laymen, *There Is Something YOU Can Do About Cancer*. As part of this "message of hope about cancer," Metropolitan field representatives will endeavor to place the latter publication in more than one million homes. In addition, these representatives will place in prominent locations in their communities 6,000 window cards urging early diagnosis of cancer.

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.*

**Diagnostic Procedures and Reagents. Technics for the Laboratory Diagnosis and Control of Communicable Diseases—American Public Health Association. (2nd ed.) New York: A.P.H.A., 1945. 549 pp. Price, \$4.00.**

This volume which deals with the microbiological laboratory science as applied to epidemiology has grown from a slender manual to a mature and indispensable guide and reference book. The original collection of "progress reports," assembled in the first edition, has been advantageously revised and enhanced by newer observations which cover an additional 46 pages. But more important are the 135 pages covering the new chapters on chancroid, lymphogranuloma venereum and granuloma inguinale, laboratory diagnosis of helminths and protozoa, blood cultures, the laboratory diagnosis of glanders and anthrax, trichinosis, infectious mononucleosis, the malaria parasites of man, and the diagnosis of cholera. Each of these sections is again the well balanced and diligent work of highly qualified specialists whose basic scientific and technical knowledge is fully reflected in the treatment of the subject. The references at the end of each chapter are with a few exceptions critically selected. How readily they may be accessible to students and laboratory workers in foreign countries where this volume will be invaluable remains to be determined.

Even a casual perusal of the text should convince the public health administrator and the physician that the early recognition, and the etiologic

diagnosis of an infection and an infectious disease by means of laboratory procedures requires trained personnel and proper facilities. They will likewise appreciate that the proper collection of the specimens to be examined is a paramount prerequisite to a successful laboratory diagnosis. But it must be emphasized again and again that the laboratory does not make disease diagnoses. The laboratory findings are merely diagnostic aids which must be used with great critical judgment.

In future revisions consideration should be given to the following: (a) The chapter on culture media, stains, etc., deserves critical selection of a few basic media instead of bewildering listings of formulae which are rarely used. The same applies to the elimination of such antiquities as the formula for the Giemsa and Unna's polychrome methylene blue stain. (b) A separate chapter on dysenteric infections, considering the use of the rectal swab, is indicated. (c) The epidemiologist would appreciate a discussion of the phage-typing of *Eberthella typhosa*, and finally (d) the Standards Method Committee must ultimately face the difficult task of outlining the procedures required to diagnose the virus infections.

K. F. MEYER

**Local Health Units for the Nation —A Report by Haven Emerson, M.D., Chairman, Subcommittee on Local Health Units, Committee on Administrative Practice, with the collaboration of Martha Luginbuhl, M.A. New York: The Commonwealth Fund, 1945. 333 pp. Price, \$1.25.**

We who have waited with great expectation for this report, which outlines a pattern for the complete coverage of continental United States with adequate full-time local health units, will be delighted with this monumental contribution which does credit to the authors and their distinguished colleagues of the committee, and is in keeping with the high editorial standards adopted by the Commonwealth Fund. Public health administrators have long hoped for a portrayal of a nation-wide plan which will tell us just how many local health departments (county or district) are needed for each part of the country, and how much is needed in the way of personnel and financial support to operate such departments. Now we have in tabular and pictorial form suggestions for a complete coverage with a minimum service to be provided and operated by physicians, engineers, nurses, and others professionally trained in public health, assisted by clerical and other professional associates of qualified training and background, and financed by resources of local government aided as conditions may indicate by state and federal contributions.

This report contains valuable information as to the personnel employed in public health work at the local level and the costs of these services. It also includes pertinent information as to population, size of areas covered, the per capita resources of the people, provision of general hospital beds and the number of practising physicians. Further, definite figures are suggested as to the number of physicians, engineers, nurses, and other personnel which are needed to fulfil the requirements of an adequate minimum local health service.

Consideration has been given primarily to those recognized functions of local government, including (a) vital statistics, (b) communicable disease control, (c) environmental sanitation, (d) public health laboratory services,

(e) maternal and child health services, (f) health education.

In the opinion of the committee, country-wide basic, minimum coverage can be secured through 1,200 local health units directed by full-time medical and public health trained administrative officers, supported by 1 public health nurse for each 5,000 of the population, 1 public health engineer, and 1 environmental sanitation officer per 50,000 population, 1 clerk per 15,000 population, part-time clinicians, dentists, laboratory workers, etc. Each of the 1,200 local health units is designed to serve a minimum of approximately 50,000 population. No unit of local government below the county is included, except under a few special circumstances. Both the urban and the rural areas of the county are consolidated into a single health unit.

The committee declares that one-third of the nation now lives under substandard local health organization. Approximately 20,000 local health units, in addition to some 70,000 school boards are responsible for local health services, which can be efficiently concentrated into 1,200 units. Enabling legislation already exists in many states. The report contains a chapter dealing with state laws requiring or authorizing the creation of local health jurisdictions.

To man these health units there are needed 2,060 administrative health officers, 6,145 part-time practising physicians for clinical service, 26,400 public health nurses, 5,800 environmental sanitation workers, one-third of whom should be public health engineers, 8,930 clerical and secretarial workers, 3,535 laboratory workers, 3,790 dentists, 4,265 dental hygienists, and 540 health education specialists.

A plan is presented for each state of the Union, not as a final prescription without the elasticity required for individual local situations, but as basic principles upon which may be built the

type of local health service to which our people are entitled, and which is essential to the maximum application of modern medical and public health sciences.

The committee recommends that the salary of the professional medical public health officer should be not less than the net professional income of good surgeons and medical clinicians or internists of the community.

This report should be available to every public health administrator and to every individual concerned with the promotion of the health and well-being of the people of the United States.

HENRY F. VAUGHAN

**Medical Care and Health Services for Rural People—*Report of the National Rural Health Conference in April, 1944*** Chicago: Farm Foundation, 1944. 226 pp. Price, \$1.00.

In April, 1944, representative leaders of the National Grange, the Farm Bureau Federation, the Farmers Union, and the Southern Tenant Farmers Union conferred for three days on the increasingly critical—and common-ground—problems of rural health and medical care. Sponsored by the Farm Foundation, the conference assembled about 100 rural “consumers,” leaders of professional groups, and technical specialists.

This is a complete record of a milestone conference—with its talks, round table discussions, and illustrative charts, and with useful summaries. Those interested in equal health opportunity for our 57 million rural citizens will find here an informal sourcebook on virtually every aspect of the problem. Rural shortages of doctors and hospitals are described vividly by those who have experienced them, and assessed statistically by the experts. Governmental and voluntary measures to improve rural health are outlined. The extension of public health services and the

development of health insurance plans are discussed in detail. Here are all the elements of rural health—the present situation, background, trends, accomplishments, unfinished tasks, and prescriptions for progress.

An active committee on rural health set up jointly by the farm organizations has emerged from this conference. Farm people are setting as their first goal a parity in health services with urban people.

FREDERICK D. MOTT

**Textbook of Healthful Living—*By Harold S. Diehl, M.D. (3rd ed.)*** New York: McGraw-Hill, 1945. 707 pp. Price, \$2.50.

A textbook for use in college courses in hygiene should be comprehensive, scientific, and readable. All these criteria are met by Diehl's *Textbook of Healthful Living*.

The text deals with personal and community health topics and with problems of physical health and mental health. In numerous sections the interrelationships between mental and physical health are discussed. Appropriate attention is given to sex, to parenthood, and to infant care. One chapter, in some instances more, is devoted to nutrition, to disease prevention, to the health problems of advancing years, and to choosing a health adviser.

All topics are presented with careful consideration to the scientific bases underlying the principles of healthful living. Throughout the text superstitions, fallacies and fads are exposed through a presentation of scientific facts.

This text will be valuable and useful not so much because of its scope and scientific accuracy but because of the way it is written. It is interesting and readable. Details of anatomy and physiology are minimized; principles of living are emphasized. The book will

be read because it contains information which young men and women want, not just because they are given assignments to read.

Although the 3rd edition of this text has many of the characteristics of earlier editions, it contains an expanded chapter on mental hygiene, and new material on heredity, narcotics, drug addiction, and care of the skin. New developments in various areas have been recognized and incorporated into the text. Statistics have been brought up-to-date. The glossary represents a convenient and useful addition.

This text is highly recommended to instructors of college hygiene courses.

CHARLES C. WILSON

**The Autobiography of Science—**  
*Edited by Forest Ray Moulton and Justus J. Schifferes. Garden City, N. Y.: Doubleday Doran, 1945. 666 pp. Price, \$4.00.*

It would seem to be an impossible task to present, in one volume, the highlights of scientific progress from the dawn of history to the present. In the book under review these highlights are clearly described by the scientists themselves, specific passages from their writings being selected for this purpose by the editors, who have welded the whole together with brief introductory commentaries in order to orient the reader through the centuries.

The excerpts are not mere fragments, but well written papers, usually several pages in length. For those interested in public health there are many pertinent excerpts, beginning with two from anonymous Egyptian physicians and four from Hippocrates, and continuing with highlights in medicine, chemistry, and public health to the present time. Altogether these medical excerpts make up about one-quarter of the entire volume, a proportion which seems to be a very fair allotment.

In the remaining three-fourths of the

book the list of scientists represented runs from Aristotle, Archimedes, Pliny, and other writers of antiquity through Roger Bacon, Leonardo de Vinci, Copernicus, Galilei, Francis Bacon, Newton and a host of others to Maxwell, Hertz, Willard Gibbs, Lord Kelvin, Roentgen, Curie, Rutherford, Poincaré, Einstein, Planck, Bohr, de Broglie, and other scientists of the present day.

All this looks like much formidable reading, but the editors have converted it into a mental feast which can be enjoyed by every intelligent layman.

In the opinion of the reviewer the excerpt from Paracelsus as well as the introductory comment by the editors fails to do justice to the real achievements of this curious but undoubtedly influential mediaeval figure. In the excerpt from Fracastor the correct name of the swineherd is Syphilus. These are insignificant lapses in an excellent book.

CHARLES F. BOLDUAN

**The Municipal Year Book, 1945.**  
*The Authoritative Résumé of Activities and Statistical Data of American Cities—By Clarence E. Ridley and Orin F. Nolting. (12th ed.) Chicago: The International City Managers' Association, 1945. 603 pp. Price, \$8.50.*

The purpose of the 12th edition of this useful volume continues to be "that of supplying municipal officials with discussions of the current problems of cities, facts and statistics on city activities, and analyses of trends by population groups."

Readers of the *Journal* will be particularly interested in a 24 page chapter on public health, which includes Outstanding Developments in 1944, and an article by Dr. Joseph W. Mountin on Joint City-County Health Units, with detailed figures on health department expenditures and personnel for cities with populations of 10,000 or over that are served by city-county or district health units rather than by a municipal

health department. This represents a radical departure; previous editions gave such figures for all cities, whether in municipal or consolidated units—in 1943 totaling 410 cities of 25,000 population and over and 439 of the 662 cities with populations between 10,000 and 25,000. The present data are for 306 cities, with populations of 10,000 or more that are served by 237 city-county units or health districts, and include no city health departments. Although this arrangement omits almost all cities with populations of 100,000 or over and otherwise makes comparison with other years difficult, it highlights the obviously accelerated trend toward consolidated health units.

It is to be hoped that the present series of figures will be continued in future issues but that simpler methods of presenting the data for the non-technical reader may be developed, and that space may also be found for showing figures for city health departments.

MARTHA LUGINBUHL

**Manual of Clinical Mycology—**  
*By Conant, Martin, Smith, Baker and Callaway. Philadelphia: Saunders, 1944. 348 pp. 148 illus. Price, \$3.50.*

In this volume the worker in this field will find for the first time collected in one volume the vast knowledge concerning these important diseases. The authors have given a chapter to each disease and have included such points as source of infection, geographic distribution, the clinical picture, with prognosis and method of treatment, the pathology, immunology, and differential diagnosis. The importance of the laboratory in making a diagnosis is stressed and a clear description of the fungus involved, both as to its appearance in the diseased tissue or exudate and in the cultural phase, is given. The illustrations are liberal and good. The chapter on laboratory contaminants is especially well done. The technician

will be very grateful for the hints as to mycologic methods given in the Appendix.

This book will fill a long felt need both on the part of the clinician and the mycologist. The authors are to be complimented upon the clear and concise way in which the material is presented.

RHODA W. BENHAM

**Bacterial Infection, With Special Reference to Dental Practice—**  
*By J. L. T. Appleton, Sc.D. (3rd ed.) Philadelphia: Lea & Febiger, 1944. 498 pp., illus. Price, \$7.00.*

Although the author has written this volume with special reference to dental practice, the reviewer will address his comments to physicians, nurses, and other public health personnel. Public health administrators who are finding it difficult to orient dental health within the field of public health should find this book most enlightening. As Dr. Appleton states, "In the field of infection as in no other department of pathology or practice, both professions (medicine and dentistry) meet on common ground."

In a chapter devoted to focal infection, the author presents a comprehensive overview of the subject, discussing among others, The Pros and Cons of the Concept of Focal Infection, The Mechanism of Focal Infection, and Culpability of a Given Focus. Dr. Appleton's scientific approach is revealed by his discussion of "locus minoris resistentiae . . . when taken more seriously than as a glib and impressive sounding truism it is not only useless but is harmful in lulling our curiosity and dampening our search for understanding of what really happens."

Likewise in his chapter on Vincent's Infection the reader may obtain a carefully prepared summarization of competent studies. Dr. Appleton is supported by some recent investigations by the U. S. Public Health Service when



he states, "Furthermore, once the disease is established, thorough hygiene of the mouth is necessary for cure. Sole reliance should not be placed on topical applications. It is requisite that septic crowns and bridges and decayed roots be radically removed."

Chapters on Infectious Agents and Carriers, Minimizing of Infectious Diseases, include brief discussions in the field of public health. However, since these have been written for undergraduate dental students and dental practitioners, a public health official will find them inadequate for his purposes.

In supporting his opinions throughout the book Dr. Appleton presents a fairly complete bibliography. However, in some instances the book would be immeasurably improved by including later citations. This is particularly true in his discussion of venereal diseases.

Undoubtedly this book, now in its third edition, belongs on dental as well as public health shelves. To the dentist it offers a working guide in the field of infection. The physician may obtain better understanding of the rôle of dental health in public health by a careful study of Appleton's *Bacterial Infection*.  
J. M. WISAN

*Essentials of Body Mechanics in Health and Disease—By Joel E. Goldthwait, M.D., Lloyd T. Brown, M.D., Loring T. Swaim, M.D., John G. Kuhns, M.D. With a chapter on "The Heart and Circulation as Related to Body Mechanics" by William J. Kerr, M.D. (4th ed. rev.) Philadelphia: Lippincott, 1945. 337 pp. Illus. Price, \$5.00.*

The revised edition of this book is timely in view of the increased interest in physical fitness and rehabilitation. The first four chapters describe postural differences in the three types of anatomic build—intermediate, slender, and stocky—and discuss ways in which

structure and body alignment affect function. Deformities which may develop through faulty use of the body are described.

Although the effect of body mechanics upon general health and efficiency is repeatedly stressed, more than half of the book is devoted to the diagnosis and treatment of faulty body mechanics in patients with chronic diseases. There is a new chapter on geriatrics and new material has been incorporated in several chapters, notably the chapter on the foot and body mechanics. The use of case histories and illustrations throughout is excellent.

The chapter on the public health aspects of body mechanics is one of the most significant. The factors which influence efficient use of the body in infancy, early childhood, the school years, and in industry are discussed. The authors believe that the greatest advances can be made through early training which will insure habitual everyday use of the body at the maximum of efficiency.

The importance of careful instruction of the patient is mentioned but no reference is made to one of the most troublesome problems in postural training—the development within the individual of an earnest desire to use his body correctly at all times.

This book will be useful to physicians, nurses, physical therapists, and instructors in physical education.

JESSIE L. STEVENSON

*An Index of Differential Diagnosis of Main Symptoms—Edited by Herbert French, C.V.O., C.B.E., M.A., M.D. Oxon, F.R.C.P. (6th ed.) Baltimore: Williams & Wilkins, 1945. 1128 pp. Illus. Price, \$17.00.*

The publication of the 6th edition of French's *Differential Diagnosis* has significance for public health workers who may have used this work, as has the reviewer, over a period of many

years for its value in suggesting alternative diagnoses. For this purpose there is nothing like it in comprehensiveness and simplicity. To be sure, it still is British in its point of view and its illustrations, but until something better makes its appearance it can be highly recommended for the reference shelf. The changes noted between the first edition in 1912 and the present throw light on improved methods of diagnosis during a period of rapid changes in medicine. The authors and publishers must have overcome great difficulties in publishing this "fully revised" edition in wartime.

REGINALD M. ATWATER

**Engineering Preview**—By *Grinter, Holmes, Spencer, Oldenburger, Harris, Kloeffer and Faires*. (*Home Study Edition*.) New York: Macmillan, 1945. 619 pp. Price, \$6.00.

This unusual text, particularly prepared for near senior high school students and college freshmen as an introduction to the field of engineering, provides worth while study for practising engineers and others with a determination to master the subject. The sections, each prepared by a prominent author in the particular field, present in a detailed and well correlated manner orientation in science and engineering, the science of matter and molecules (chemistry), the language of engineering (technical drawing), the universal tool of engineering (mathematics), the engineer's coat of arms (the slide rule), and other sections devoted to light and electricity, mechanics, thermodynamics, and technical report writing. Also included are Tables for Mathematical Calculations and a Comprehensive Examination of the entire text, with answers. Marginal headings provide convenient reference to the content of each paragraph.

The section devoted to orientation in engineering and science traces the evolu-

tion of engineering, discusses traits and mental abilities for careers as technicians, engineers, and scientists, describes some monumental accomplishments in the various fields of engineering, and is highlighted by a "parlor test" for engineering aptitude. Each succeeding section is presented in a concise, understandable manner with an abundance of sketches, drawings, and photographs to supplement the written material. Typical problems with answers are provided in each section to test the reader's knowledge of the subject matter.

This text brings together in a single volume the essential background material for persons interested in professional engineering. Engineers will find this book useful as a refresher course, for basic information on recent engineering developments in such fields as synthetics, electronics and jet propulsion, and preparation for professional engineer examinations.

JOSEPH A. KESTNER, JR.

**National Health Agencies**—*A Survey with Especial Reference to Voluntary Associations, including a Detailed Directory of Major Health Organizations*. By *Harold M. Cavins*. Washington: Public Affairs Press, 1945. 251 pp. Price, \$3.00.

National health agencies are fortunate to have been given a historian gifted with the ability to extract from dusty records and from the memories of the few who remain, a flowing account of the origins of 10 national agencies and of 4 of their older professional voluntary organizations. With admirable conciseness, vividness, and human touch, the significant events unfold and the reader easily imagines he was on the scene. Thorough familiarity with his sources has enabled the author to weave into his text the recorded words of those most actively concerned and to provide a footnote

bibliography covering 297 references. While several of the national health agencies have had their origin and history recorded in easily accessible volumes—Knopf's and Beer's for example—most of the historical data are incomplete or difficult of access. Dr. Cavins has performed an important service in assembling the facts so reliably and interestingly in one small volume. Public health minded readers will find it an exciting and rewarding book.

Two special features of this volume call for comment. Chapter 3, an essay entitled "Social Awakening," presents the setting for the modern voluntary movement, and gives a perspective every health worker should have. Chapter 18, given the uncomplimentary title "Miscellaneous Organizations," contains thumb-nail sketches of 82 national agencies that have a particular, though not always exclusive, interest in health. The list is far from complete, and lacks the telltale figures of income or disbursements, but it is more readable than the listings in the *Social Work Year Book*.

The Index, limited to names of individuals and organizations, offers the minimum of usability, and the paper on which the book is printed seems an unnecessarily drastic reminder of the importunities of these war years.

PHILIP S. PLATT

**The Mosquitoes of New Jersey and Their Control**—By Thomas J. Headlee. *New Brunswick: Rutgers University Press, 1945. 326 pp. Price, \$4.00.*

This volume is to a large extent an expanded and modernized version of New Jersey Agricultural Experiment Station *Bulletin 348* issued in 1921.

As the author states in his introduction, "There is included in this book such information about mosquitoes, their description, life histories, breeding

places, food, natural enemies, and control, as to furnish scientific investigator and practical mosquito worker alike with fundamental information, necessary to a proper understanding of mosquitoes and their control." This objective is not quite realized, however, since the author appears to have disregarded, to some extent, the observations and experiences of investigators working with the same species of mosquitoes outside of New Jersey.

The chapter on mosquito control contains an excellent discussion of procedures useful for controlling mosquitoes breeding in tidal salt marshes. The chapters on larvicides and mosquito repellents are interesting and instructive, although the former suffers somewhat because of a rather sketchy treatment of the subject.

A detailed discussion of the biology of thirty-seven species of mosquitoes native to New Jersey takes up more than half of the book. It is interesting to note how many of Dr. John B. Smith's early observations have stood the test of time.

The keys included for the identification of the larvae and adult females of New Jersey species of mosquitoes are not entirely satisfactory. A few species could not be separated on the basis of the characters given. Other characters, of considerable importance in distinguishing between the species involved, are not included in the keys.

HERMAN L. FELLTON

**Social Work Year Book 1945**—Edited by Russell H. Kurtz. (8th ed.) *New York: Russell Sage Foundation, 1945. 620 pp. Price, \$3.25.*

Even a casual perusal of this useful volume of 75 articles prepared by specialists in social work and related fields indicates the close interrelationships of the parts of our complex social structure. A dozen activities discussed in previous editions as parts of other

articles are given separate sections, while four new topics have been introduced. Fifteen or more articles deal with various aspects of public health (including child health, sight conservation, social hygiene and tuberculosis), in addition to a separate comprehensive and well balanced review of this broad field by the recent Editor of the

*American Journal of Public Health.* Part II contains two useful directories of national agencies, 70 of which are governmental and 402 voluntary. Selected bibliographies at the end of articles add value to this standard reference text designed in content and price for a wide audience.

IRA V. HISCOCK

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.*

AN ACTIVITY PROGRAM IN HOME MAKING. By Edris L. Butler and Laura Patton. Peoria: The Manual Arts Press, 1944.

Part One—You and Your Home. 32 pp. Price, \$2.00.

Part Two—Your Daily Food. 29 pp. Price, \$2.00.

Part Three—Your Health. 27 pp. Price, \$2.00.

Part Four—Your Wardrobe. 30 pp. Price, \$2.00.

DIET MANUAL FOR HOME NURSING. By Marie V. Krause and Eleanora Sense. New York: M. Barrows, 1945. 218 pp. Price, \$2.00.

ELEMENTS OF FOODS AND NUTRITION. 2nd ed. By Mary T. Dowd and Alberta Dent. New York: Wiley, 1945. 357 pp. Price, \$2.25.

A FOOD AND NUTRITION PROGRAM FOR THE NATION. A Report by a Subcommittee of the Agriculture, Business, and Labor Committees on National Policy. Washington, D. C.: National Planning Association, 1945. Planning Pamphlets No. 46. 35 pp. Price, \$25.

GOVERNMENT IN PUBLIC HEALTH. By Harry S. Mustard, M.D. New York: Commonwealth, 1945. 219 pp. Price, \$1.50.

HOW TO GET AND KEEP GOOD HEALTH. Edited by Stella Regina Dolan. New York: Ackerman, 1945. 240 pp. Price, \$2.00.

INDUSTRIAL HEALTH ENGINEERING IN THE TUNNELING OPERATIONS OF THE TENNESSEE VALLEY AUTHORITY. By Frank N. Chirico. Chattanooga: T.V.A. 135 pp.

LOCAL HEALTH UNITS FOR THE NATION. By Haven Emerson, M.D., with the collaboration of Martha Luginbuhl, M.A. New York: Commonwealth Fund, 1945. 333 pp. Price, \$1.25.

MUSIC FOR YOUR HEALTH. By Edward Podolsky, M.D. New York: Ackerman, 1945. 134 pp. Price, \$2.00.

NUTRITION REVIEWS. Vol. 2. Nos. 1-12. January-December 1944. New York: Nutrition Foundation, 1944. 380 pp. Price, \$1.75.

PATHS TO BETTER SCHOOLS. TWENTY-THIRD YEARBOOK. Washington, D. C.: American Association of School Administrators, 1945. 415 pp. Price, \$2.00.

PULMONARY EDEMA AND INFLAMMATION. By Cecil K. Drinker, M.D. Cambridge: Harvard University Press, 1945. 106 pp. Price, \$2.50.

A RECORD OF THE PROCEEDINGS OF THE UNITED STATES-MEXICO BORDER HEALTH CONFERENCE, MEETING IN CIUDAD JUAREZ, CHIHUAHUA, MEXICO AND EL PASO, TEXAS, May 30, 31, June 1, 1944. El Paso: United States-Mexico Public Health Association, 1944. 126 pp.

SIX-YEAR CAPITAL IMPROVEMENT PROGRAM FOR MARYLAND. Revised—1945. Prepared by Thomas F. Hubbard, Consultant for the Maryland State Planning Commission, Abel Wolman, Dr. Eng., Chairman, and the Department of Budget and Procurement. Baltimore: Maryland State Planning Commission, 1945. Publication No. 43. 180 pp. Price, \$25.

STUDENT'S GUIDE IN NURSING ARTS. By M. Esther McClain, R.N. St. Louis: Mosby, 1945. 407 pp. Price, \$3.00.

VIRUS AS ORGANISM. Evolutionary and Ecological Aspects of Some Human Virus Diseases. By Frank MacFarlane Burnet, M.D. Cambridge: Harvard University Press, 1945. 134 pp. Price, \$2.00.

VOLUNTARY HEALTH AGENCIES. AN INTERPRETIVE STUDY. By Eelskar M. Gunn and Philip S. Platt. Foreward by Louis I. Dublin. New York: Ronald Press, 1945. 364 pp. Price, \$3.00.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**When Rats Eat as Some Humans Do**—Studies on rats are reported which support the working hypothesis that resistance to infection may be depressed by inadequate nutrition. Though malnutrition may be a factor in susceptibility, it is not necessarily true of every type of infection.

BERRY, L. J., *et al.* The Relationship Between Diet and the Mechanisms for Defense against Bacterial Infections in Rats. *J. Lab. & Clin. Med.* 30, 8:684 (Aug.), 1945.

**Once It was Called "Shimamushi"**—All that you need to know about scrub typhus should be found in these two papers, for they comprise more than 150 pages. This being vacation time, it is needless to add that I did not read them.

BLAKE, F. G., *et al.* Studies on Tsutsugamushi Disease (Scrub Typhus, Mite-Borne Typhus) in New Guinea and Adjacent Islands. *Am. J. Hyg.* 41, 3:243 (May), 1945.

**If Provision Is to Be Made for Dental Health**—Dental diseases are the most prevalent of all man's afflictions, and the most neglected. The rich and the city dwellers get more dental care than the poor and the country folk. An eight point program to meet this well recognized need is proposed.

FALK, I. S. Health Security With Special Reference to Dental Health Problems. *Tic* (July), 1945, p. 2.

**Reassuring Papers about Influenza Prophylaxis**—One inoculation with influenza vaccine used at the beginning of a local epidemic effectively decreased the incidence of the disease

among the protected group. This is only one cautious conclusion of one paper in a series of seven, but it seems to be enough to indicate to you whether or not you will want to look up the whole symposium.

HALE, W. M., and McKEL, A. P. The Value of Influenza Vaccine When Done at the Beginning of an Epidemic. *Am. J. Hyg.* 42, 1:21 (July), 1945.

**Through the Nose**—Nose cultures are better measures than throat cultures of a strep patient's potential of danger as a carrier, this research seems to indicate.

HAMBURGER, M., JR., *et al.* The Problem of the "Dangerous Carrier" of Hemolytic Streptococci. *J. Infect. Dis.* 77, 1:68 (July-Aug.), 1945.

**The Eyes Have It**—This information about lighting, set forth briefly for the benefit of the ophthalmologist, could be used by many more of us to whom the public comes for guidance. You'll be particularly interested in the comments on fluorescent lighting.

HARDY, L. G. H., and RAND, G. Elementary Illumination for the Ophthalmologist. *Sight-Saving Rev.* 15, 1:30 (Spring), 1945.

**Anent Health Centers**—Under the proposed British "National Health Service," health centers are to assume a new importance and local authorities are adjured to provide the best possible working conditions for group medical practice. Administrators on this side of the pond may want to know what their more adventurous brothers are doing to provide a complete health service for all.

HOBEN, G. H. Community Health Centres and Their Function. *J. Roy. Inst. Pub. Health & Hyg.* 8, 8:198 (Aug.), 1945.

**Use and Abuse of Movies—**Better health movies will come when users demonstrate judgment and discrimination in their use, says a man who should know what he is talking about for he's made and projected them for many a year.

KLEINSCHMIDT, H. E. How to Use Movies. *Pub. Health Nurs.* 37, 8:392 (Aug.), 1945.

**Helping Europeans to Help Themselves—**Our own Hugh Leavell tells the British brethren, "every evaluation of health education has demonstrated the fact that more can be accomplished by personal contact than by any other method." Nurses: take a bow!

LEAVELL, H. R. World Relief and Health Education. *Health Ed. J.* 3, 3:98 (July), 1945.

**The Wisdom of the Body—**From this study of the excretion of fluorine when excessive amounts were fed experimentally to adult subjects it is evident that the addition of fluorine to drinking water would not create a public health hazard.

McCLURE, F. J., *et al.* Balances of Fluorine Ingested from Various Sources in Food and Water by Five Young Men. *J. Indust. Hyg. & Toxicol.* 27, 6:159 (June), 1945.

**No Royal Road—**In Norfolk, more individuals (with infectious venereal lesions) applied voluntarily for medical aid than were brought under care by

epidemiologic means. This conclusion of a case finding study stresses the importance of community educational measures.

PARISER, H. Analysis of Case-Finding Methods in Community Venereal Disease Control. *V. D. Inform.* 26, 6:120 (June), 1945.

**Eye-Opener about Germicides—**Six different ways to kill germs. We thought that the last word had been said long ago about sterilization until we read this 40-odd page correlation of the wide knowledge of physical disinfection with an accompanying discussion of the methods by which the physical agents kill the bug.

RAHN, O. Physical Methods of Sterilization of Microorganisms. *Bact. Rev.* 9, 1:1 (Mar.), 1945.

**Quote—**Thromboangiitis obliterans is caused by smoking in individuals constitutionally sensitive to tobacco. Unquote.

SILBERT, S. Etiology of Thromboangiitis Obliterans. *J.A.M.A.* 129, 1:5 (Sept. 1), 1945.

**Pendulum at Work—**In place of rigid four hour infant feedings, self-demand is to set the schedule, the nursling taking his nourishment as often and for as long as he wants. Benefits, psychological and physiological, are discussed.

SIMSARIAN, F. P. Further Records of the Self-Demand Schedule in Infant Feeding. *J. Pediat.* 27, 2:109 (Aug.), 1945.

# ASSOCIATION NEWS

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Arthur G. Baker, M.D., Gray Hawk, Ky.,  
Health Officer, Johnson-Magoffin County  
Health Dept.

James A. Collins, Jr., M.D., Geisinger Memo-  
rial Hospital, Danville, Pa., Pres., Board  
of Health

M. T. Johnson, M.D., M.P.H., District Health  
Office No. 5, Fort Dodge, Ia., Medical  
Director

Capt. Trois E. Johnson, M.C., Det. 404,  
Hqs., SEAC, APO 432, Postmaster, New  
York, N. Y., Surgeon, Medical Inspector,  
Venereal Disease and Malaria Control  
Officer

### *Laboratory Section*

William E. Botwright, 4963 Manchester Ave.,  
St. Louis 10, Mo., Bacteriologist, Vestal  
Chemical Co.

Robert C. Cleverdon, U. S. Naval Medical  
Supply Depot, Brooklyn, N. Y., Pharmacist  
Doris K. Kellogg, M.A., 1101 Elder St.,  
Houston 10, Tex., Serobacteriologist, Hous-  
ton City Health Dept.

Lt. Nicholas Marolda, Sn.C., 120 Division St.,  
Trenton, N. J., Laboratory Officer, U. S.  
Army

### *Vital Statistics Section*

Carl R. Doering, M.D., 28 Coolidge Hill Rd.,  
Cambridge, Mass., Asst. Prof. of Vital  
Statistics, Harvard School of Public Health

Floyd M. Lindemann, A.M., Park Manor,  
Babson Park 57, Mass., Director of Pro-  
grams, Bay State Society for the Crippled  
and Handicapped, Inc.

Marian G. Maloon, M.Ed., State House, Con-  
cord, N. H., Registrar of Vital Statistics,  
State Dept. of Health

Orlando Vaz Vieira dos Santos, M.D., Rua  
Fernaõ Dias 753, Sao Paulo, Brazil, S. A.,  
Director of Health Center, Health Dept.

### *Engineering Section*

Howard B. Hollander, 1183 Hilltop Rd.,  
Kansas City 2, Kan., Asst. Sanitarian (R),  
U. S. Public Health Service

Lt. (jg) Julian J. Raynes, Med. Dept., Navy  
No. 29, FPO, San Francisco, Calif., Public  
Health Engineer

James M. Thornton, R. D. 3, Pomeroy, O.,  
Sanitarian Meigs County Health Dept.

Hardy Watson, C.E., P. O. Box 1358, Law-  
ton, Okla., Sanitarian, County-City Health  
Dept.

### *Industrial Hygiene Section*

Jacob S. Sharrah, Bureau of Industrial  
Hygiene, 224 Jr. OUAM Bldg., Pittsburgh  
13, Pa., Junior Industrial Hygiene Engi-  
neer, State Dept. of Health

### *Food and Nutrition Section*

Benjamin Albagli, M.D., 61 Pereira Barreto,  
Rio de Janeiro, Brazil, S. A., Privatdocent,  
Food and Nutrition, Univ. of Brazil

Earl C. Chamberlayne, D.V.P.H., 214 Ash  
St., New Westminster, B. C., Canada,  
Director of Food and Milk Control, Prov-  
ince of Manitoba

Emilio Giro, M.D., 6 Num. 353, Vista  
Alegre, Santiago, Cuba, Private Practice

Lt. Robert A. Nanz, Sn.C., 5 Meadowbrook  
Village, Plainfield, N. J., Nutrition Officer,  
U. S. Army

Hulda Stettler, M.S., 405 Cherry St., S. E.,  
Grand Rapids 3, Mich., Nutrition Con-  
sultant, State Dept. of Health

Merton H. Wilpon, Bayport Ave., Bayport,  
L. I., N. Y., Medical Professional Service,  
G. D. Searle & Co.

### *Maternal and Child Health Section*

Alma M. Simpson, R.N., 210 Corby Bldg.,  
St. Joseph, Mo., Director of Public Health  
Nursing, St. Joseph Organization for Pub-  
lic Health Nursing

### *Public Health Education Section*

Karyl K. Chipman, Industrial Hygiene Divi-  
sion U. S. Public Health Service, Washing-  
ton 14, D. C. (Bethesda Station), Informa-  
tion Specialist

Homer F. Davis, 106 Gazetta Bldg., Emporia,  
Kan., Kansas State Representative, Na-  
tional Foundation for Infantile Paralysis,  
Inc.

Marguerite L. Ingram, M.A., Agricultural  
College, Extension Service, Fargo, N. D.,

Specialist, Medical and Health Studies,  
Farm Foundation

Ora Marshino, A.M., National Cancer Institute, Bethesda 14, Md., Administrative Asst. and Information Specialist

Irma G. Nevins, Ed.D., M.A., American National Red Cross, Washington, D. C., National Director of Accident Prevention

Myrtle Ousley, M.S.P.H., Washington County Health Dept., Greenville, Miss., Health Education Consultant

Marjorie A. Patten, 1921 E. 83rd St., Cleveland 3, O., Instructor, Cleveland Division of Health

Irwin V. Shannon, Ph.D., 1101 Swetland Bldg., Cleveland, O., Exec. Director, Cleveland Mental Hygiene Assn.

Gertrude E. Timen, M.S., 2733 Hampshire Rd., Cleveland Heights, O., Health Educator, Cleveland Division of Health

Miriam Weinrib, M.S., 256 Division Ave., Brooklyn 11, N. Y., Field work experience with health agencies in Cleveland

#### *Public Health Nursing Section*

Margaret A. Handlin, R.N., P. O. Box 152, East Moline, Ill., Public Health Nurse, State Dept. of Public Health

Catherine F. McGovern, 326 64th St., Newport News, Va., Public Health Nursing Consultant, U. S. Public Health Service

Dalya Wildebar, M.A., 259 State St., Albany, N. Y., Communicable Disease Consultant, State Dept. of Health

#### *Epidemiology Section*

Mohyeddin Ahmed Farid, D.T.M., D.P.H., 28 Riad Pasha St., Helwan, Egypt, Asst. Director of Gambiæ Eradication Service, Ministry of Public Health

Edwin A. Mandel, Navy Base Box 120, Navy 3245, FPO, San Francisco, Calif., Sanitation Officer

Antonio van Praag, M.D., M.P.H., Quinta Mucura Av. Don-Bosco, La Florida, Caracas, Venezuela, S. A., Health Officer, Ministry of Public Health

#### *School Health Section*

Lewis A. Eldridge, Jr., M.D., Joyance, Great Neck, L. I., N. Y., School Physician, New York City Dept. of Health

J. G. Fred Hiss, M.D., 505 State Tower Bldg.,

Syracuse 2, N. Y., Cardiologist, Syracuse Public & Parochial School Health Services  
June Mason, 509 Phelan Bldg., San Francisco 2, Calif., Generalized Consultant in Public Health Nursing, State Dept. of Public Health

#### *Dental Health Section*

Arthur G. Davis, D.D.S., 1250 Craft Highway, Chickasaw, Ala., Dental Surgeon (R), U. S. Public Health Service

Philip Gerber, D.D.S., 152 W. 42 St., New York, N. Y., Dentist Supervisor, Dept. of Health

William P. Kroschel, D.D.S., M.P.H., 610 S. Canal St., Chicago, Ill., Dental Consultant, U. S. Public Health Service

#### *Unaffiliated*

Bernard Brookman, U.S.P.H.S., Navy No. 48, FPO, San Francisco, Calif., P. A. Sanitarian  
Dora Goldstine, A.M., University of Chicago, Chicago, Ill., Asst. Prof., Medical Social Work, School of Social Service Admin.

#### DECEASED MEMBERS

J. Frederick Jackson, Hamden, Conn., Elected Member 1914, Charter Fellow, Engineering Section

Thomas W. G. McKay, M.D., Oshawa, Ont., Canada, Elected Member 1924, Unaffiliated

Caroline Tillinghast, R.N., Albany, Ga., Elected Member 1937, Public Health Nursing Section

Wade H. Anderson, M.D., Wilson, N. C., Elected Member 1934, Health Officers Section

Dorothy F. Holland, Ph.D., Bethesda, Md., Elected Member 1919, Elected Fellow 1928, Vital Statistics Section

Hiram A. Jones, Ph.D., Albany, N. Y., Elected Member 1945, Public Health Education Section

Forrest A. Kelley, M.D., Winfield, Kan., Elected Member 1938, Health Officers Section

William Litterer, M.D., Nashville, Tenn., Elected Member 1926, Elected Fellow 1934, Laboratory Section

A. H. Stewart, M.D., Harrisburg, Pa., Elected Member 1939, Health Officers Section

#### HEALTH PRACTICE INDICES

The 1945 edition of *Health Practice Indices* covering the health practices of 243 health units, city and county, for the years 1943 and 1944, is now in

preparation and will be issued early in the fall by the Committee on Administrative Practice. A unique feature of this latest edition is the inclusion of a table showing the relative standing of



each community in each of the range charts, with the identifying number of the community indicated. These identifying numbers are made known to each participating community and to the state departments of health concerned. Copies will be sent to each community represented and to state health departments. Others interested may receive copies of the "Indices"

without cost upon application to the A.P.H.A. .

#### LOCAL HEALTH UNITS

The first printing of 1,000 copies of *Local Health Units for the Nation* is practically exhausted. The Commonwealth Fund, which published the volume for the Association, now plans a second printing of 1,500 copies.

### APPLICANTS FOR FELLOWSHIP

(See September Journal for additional names)

Completed Fellowship applications have been received from the following individuals. Because of the recent delays in the receipt of mail these applications will be put through the routine of election with those listed in the September Journal.

#### *Health Officers Section*

Leroy E. Burney, M.D., M.P.H., State Health Commissioner, Indianapolis, Ind.

#### *Laboratory Section*

William A. Feirer, M.D., Sc.D., Vice-President and Director, Medical Research

Division, Sharp & Dohme, Philadelphia, Pa.  
David B. Lackman, Ph.D., Assistant Bacteriologist, U. S. Public Health Service, Hamilton, Mont. (at present on military leave)

Robert M. Shaw, M.D., D.P.H., Professor of Bacteriology and Hygiene, University of Alberta, Edmonton, Alberta

#### *Vital Statistics Section*

A. Hardisty Sellers, M.D., D.P.H., Medical Officer in charge of Medical Statistics, Royal Canadian Air Force, Toronto, Ontario

---

### WANTED: BACK ISSUES OF THE AMERICAN JOURNAL OF PUBLIC HEALTH

Again the Central Office is sending out an SOS for *Journals* that are out of stock and which are especially needed now to complete sets for the countries that have been occupied and which now are requesting help in rebuilding their technical libraries. The *Journals* that can be used for this purpose are listed below:

1941—January, April, July, August

1942—January, March

1943—January, March, August, September, October, December

1944—June, August

1945—January, February, March, April

Members who can return any of the above *Journals* to the A.P.H.A. are requested to do so collect.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

### POSITIONS AVAILABLE

(Supplemental to lists in recent Journals)

**Wanted:** Two engineers for Industrial Hygiene Service of Tennessee. Four different starting salaries between \$2,364 and \$3,900 depending on training and experience. Car furnished. Positions permanent. Opportunity for advancement. Apply Dr. R. H. Hutchinson, Commissioner of Health, Nashville 3, Tenn.

**Wanted:** Physician, Division of Child Hygiene, Ohio Dept. of Health. Salary \$4,200. Must be graduate of approved medical school, have 1 year's internship and at least 1 year graduate training, plus 1 year of training or experience in clinical pediatrics or obstetrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Division of Child Hygiene, Dept. of Health, State Departments Bldg., Columbus 15, Ohio.

**Positions open:** District and County Health Officers in Florida. Medical degree required. Write or wire Merit System Supervisor, State Board of Health, Gainesville, Fla., for complete information.

**Physician wanted:** Public health pediatrics and epidemiology in large California County Health Department. Major duties consist of infant and pre-school health conferences, school examinations, and epidemiology. Beginning salary \$455 per month, plus travel allowance, and one meal a day. California license required. Training, experience in pediatrics or public health desirable. Immediately available. Apply William C. Buss, M.D., Kern Co. Health Dept., Bakersfield, Calif.

Bureau of Tuberculosis, Board of Health, Territory of Hawaii, seeks Biometrician or Statistician. Position will probably be classified under Territorial Civil Service as CAF-8 with salary of \$244.59 plus wartime bonus of \$50 and yearly increment of about \$192 up to 5 years. Bureau of Tuberculosis is also

looking for young physician experienced in tuberculosis work to have immediate charge of active case finding survey program now under way. This position classified under Territorial Civil Service as P-5 with salary of \$416.67 plus \$50 wartime bonus and yearly increment of about \$250 up to 5 years. Apply Robert H. Marks, M.D., Director, Bureau of Tuberculosis, Territorial Board of Health, Honolulu, T.H.

**Wanted:** Bacteriologist with B.S. or M.S. degree, preferably male, to teach student nurses, 45 hour course twice a year, to assist with teaching of second year medical students and do general laboratory work. Salary \$2,000 with option of complete maintenance for \$25 per month. Apply Dr. R. J. Schenken, Director, Dept. of Pathology and Bacteriology, Louisiana State University School of Medicine, New Orleans 13, La.

**Wanted:** Physician to assume directorship, Bureau of Venereal Diseases, in eastern city of 185,000 population. Permanent position. Minimum salary \$4,657, maximum \$5,197.37, includes cost of living adjustment. Travel allowance. Apply Box J, Employment Service, A.P.H.A.

Excellent opportunities, permanent tenure, for doctors, dentists, nurses, technicians with the Oregon State Board of Health in specialized fields. For information write Merit System Council, 616 Mead Bldg., Portland 4, Ore.

**Wanted:** Public health officer in well established health department in county of 68,000 population. Salary \$5,500. Apply Floyd O. Prunty, Chairman, Marion Co. Lay Health Committee, 300 Second St., Fairmont, W. Va.

**Executive Secretary Wanted.** Applicant must have some specialized training and experience in health education. Executive experience desirable. Salary \$3,000 up, depending upon qualifications.

Car furnished. Apply with full information to A. C. Martin, M.D., Nassau Co. Cancer Committee, 1551 Franklin Ave., Mineola, N. Y.

**Wanted:** Experienced graduate bacteriologist. Take complete charge of local health department laboratory. Civil service protection, tenure and pension. Starting salary \$1,980 per annum. Apply Health Department, P. O. Box 786, Plainfield, N. J.

**Wanted:** Experienced sanitarian for state dairy and restaurant inspection. Salary \$2,400 a year, plus \$5 per day expenses. Car furnished with gasoline and other expenses paid. Apply Dr. G. M. Anderson, State Board of Health, Capitol Building, Cheyenne, Wyo.

City of Jackson, Mich., Civil Service Board will accept immediate applications for position of public health nurse in city health department. Must be graduate of high school and school of nursing of recognized standing with special training in public health nursing; registration in Michigan; some experience in public health nursing, preferably with certificate in public health nursing and some knowledge of advanced public health and social service practice. Salary \$2,000 per year. Applications may be obtained from Civil Service Board, 4th Floor, City Hall, Jackson, Mich.

**Wanted:** Public Health Nurses, Knoxville Area. Generalized nursing service in new and growing health department with unusual opportunities. Starting salary \$2,500 per year or higher, depending on qualifications. Opportunity for advancement. Apply Health Officer, Oak Ridge Dept. of Health, P. O. Box 486, Oak Ridge, Tenn.

Two positions open in Sanitation Section, Div. of Health, City of St. Louis: Public Health Engineer II, salary \$210 to \$285 per month. Work consists of making surveys and studies of industrial plants, to determine nature and magnitude of industrial hygiene problems; making quantitative studies of plant environment, etc., checking protective equipment for effectiveness and making recommendations for further control measures. Study of ventilation, illumination, and sanitation of workroom. Desirable qualifications include graduation from recognized school of engineering and some experience or graduate training in industrial hygiene or public health engineering. Public Health Engineer I, salary range \$170 to \$220 per month. Engineering investigation of environmental problems and conditions, etc. Desirable qualifications include graduation from recognized

school of engineering. No experience necessary. Applications may be made to Personnel Dept., Room 235, Municipal Courts Bldg., St. Louis 3, Mo.

The following positions are available in Michigan:

Hospital Physician, III, \$287 to \$356  
Hospital Physician, IV, \$373 to \$442  
Hospital Physician, V, \$460 to \$575  
Sanatorium Physician, V, \$460 to \$575  
Psychiatrist Va, \$506 to \$616

Director of a Children's Center  
Physician IV, \$340 to \$420

Head of Medical Department,

Michigan State Reformatory

Pathologist V, \$460 to \$575

Tuberculosis Sanatorium

Medical Coordinator V, \$440 to \$550

Assistant in Crippled Children Commission

Apply to Michigan State Civil Service Commission, 220 No. Grand Avenue, Lansing, Mich.

Position of Medical Director, Crippled Children's Program, Arkansas, open. Salary \$4,600, travel expense extra and actual expense of lodging up to \$2.05 a day for meals and 5¢ a mile for travel. Minimum qualifications are 2 years pediatric residency, 1 year general rotating internship or pediatric internship, 1 year experience in public health or practice of pediatrics or general practice, the greater per cent of which is pediatrics. Salary of \$4,800 to start for applicant with higher qualifications. Prefer someone familiar with Arkansas if possible. Write Commissioner, Dept. Public Welfare, Little Rock, Ark.

**Wanted:** Physician for position of Chief, Bureau of Tuberculosis in California State Dept. of Public Health. Major duties consist of general administration, through local health units, of state and federal tuberculosis financial allotments and subsidies to institutions and of state tuberculosis program. California license required. Special training and experience in tuberculosis and public health desirable. Monthly salary, \$460 to \$540 plus \$20 emergency adjustment. Apply California State Personnel Board, 1015 L St., Sacramento, for copy of bulletin and application.

**Wanted:** Chief, Bureau of Records and Statistics, California State Dept. of Public Health. Duties consist of administration and supervision of statistical program of the department including registration of births, deaths, and marriages, morbidity statistics, service records, vital statistics and central tabulating unit. Certain administrative public health experience required. Monthly salary, \$360 to \$440 plus \$35 emergency

adjustment. Apply to California State Personnel Board, 1015 L St., Sacramento, for copy of bulletin and application.

**Wanted:** Chemist for sewage, industrial waste and pollution research. Excellent opportunity to develop a long-time research program. Indicate experience and salary required. Apply to G. H. Dunstan, Box 1996, University, Ala.

Immediately available, position as dental hygienist for well established county dental program. Basic monthly salary \$220 plus \$25 war bonus. Apply Dr. W. C. Buss, Kern Co. Dept. of Public Health, Bakersfield, Calif.

**Wanted:** Class A medical man with editorial ability and experience oriented to current trends in medical, hospital, and public health fields. Substantial initial salary and progressive opportunity. Apply Box T, Employment Service, A.P.H.A.

**Wanted:** Bacteriologist with equivalent rating of junior grade, A.B. or B.S. degree and at least 1 year experience in public health laboratory, to work in County laboratory, acting in capacity of State Branch laboratory. Salary \$150-\$180 per month. Apply Health Dept., P. O. Box 151, Arlington, Va.

**Wanted:** Assistant director for old established health agency operating in Chicago and Cook County. One quali-

fied as capable administrator, directing field staff, preferably possessing public health education and training certificate. Give full particulars as to experience, previous employment, age, etc. If application satisfactory interview will be promptly granted. Apply Box K, Employment Service, A.P.H.A.

**Wanted:** Assistant clinical director for tuberculosis division, State Dept. of Health. Must be graduate of certified Class A medical school with at least one year's experience in the field of tuberculosis, including or supplemented by six months' experience in interpretation of x-ray films. Must have Iowa license. Starting salary \$4,000 with travel expenses. Apply State Dept. of Health, Div. of Tuberculosis, 1027 Des Moines St., Des Moines 19, Iowa.

**Wanted:** X-ray technician for State Dept. of Health, using 35 mm. and 14x17 x-rays. Able to care for equipment, take x-rays, develop films, etc. Must be high school graduate, with special training in school for training x-ray technicians covering at least three months, one year experience in use of x-ray apparatus. Two years' experience in use of x-ray equipment may be substituted for three months' school training. Starting salary \$1,680 with travel expenses. Apply State Dept. of Health, Div. of Tuberculosis, 1027 Des Moines St., Des Moines 19, Iowa.

### POSITIONS WANTED

Physician, experienced in infectious diseases and communicable disease control, wishes position preferably as teacher. Will consider epidemiology or communicable disease control in health department. A-515

Industrial Hygienist, age 33, B.S. in Ch.E. Graduate training Harvard School of Public Health. Two years insurance engineering, 9½ years full charge industrial hygiene, heavy industry, patents, publications; now directing industrial research; desires responsible position in private industry. IH-460

Industrial Hygiene Engineer, B.Sc.,

age 31. Ten years' experience in industrial hygiene and safety. Seeks opportunity as industrial hygiene engineer or industrial hygiene and safety director. IH-461

Health educator, Ph.D. Michigan, experienced in health, physical education, and teaching. Excellent references. H-516

Health educator, Ph.D., Harvard, with training in medical science, public health and education, experienced as teacher, seeks position in Northeastern United States. H-512

[END OF A.P.H.A. LISTING]

## Opportunities Available

### Advertisement

**WANTED**—(a) Director of city and county health unit; work involves routine public health activities, directing venereal disease clinic and general medical clinics; staff of five nurses; town of 15,000; Southwest. (b) Public health physician to direct program for cancer control; preferably someone experienced or particularly well trained in cancerology; should be capable public speaker and able to qualify for teaching appointment on faculty of university medical school. (c) Director of student health department; pre-war student enrollment 1,800; plans for expansion will increase enrollment to 3,000; new campus health center, splendidly equipped; West. (d) Dentist to become associated with municipal health department; city of 70,000; Southeast. (e) County physician; duties consist of conducting clinic connected with county hospital, emergency calls for county patients, obstetrics; \$500 including office car expenses; health resort town in Southwest, short distance from Mexican border. (f) Professor and head of department of hygiene; state university planning expansion program and offering curriculum of Public Health whereby students may major and receive Baccalaureate degree; young man experienced in teaching qualified to develop program required. **PH10-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Director of public health nursing; duties consist of making complete survey of health situation in city and county; permanent appointment; \$250; Middle West. (b) School nurse; duties include some visiting nursing; \$180-\$210; Chicago area. (c) Venereal disease supervisor and, also, tuberculosis supervisor; generalized program in correlation with visiting nurse association; staff of 41 nurses; \$2,640, including travel expense; central metropolis. (d) Supervisor of public health department; staff of twelve; generalized program with considerable tuberculosis work; community of 75,000; New England. (e) Public health nurse experienced in obstetrics to serve as consultant with county health department;

town of 40,000; Pacific Northwest; \$225-\$275. (f) Several staff nurses recently inaugurated public health program; salaries start at \$225 if assigned to the interior, \$215 for urban appointments; Alaska. (g) Several public health nurses; department of education, private agency; duties educational in nature; vicinity New York City; \$1,800-\$2,880. **PH10-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Executive secretary; health division comprised of 35 agencies, public and private and serving community of a million population; candidate well trained in public health field with experience in community organization and health education required; \$5,000-\$6,000. (b) Health educator; municipal department; vicinity, Washington, D. C. (c) Director of public relations; private agency for crippled children. (d) Public health engineer; city-county health department; county population 100,000; Middle West. (e) Sanitary chemist for sewage, industrial waste, and pollution research; excellent opportunity developing long-time research program; college of engineering, state university. **PH10-3** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Professors of bacteriology and parasitology; university operated under American auspices in Asia; country predominantly Christian; city in which university is located has population of 150,000 and is considered important seaport. (b) Assistant; department of bacteriology, agricultural college; must be qualified to teach immunity, serology, bacteriology; minimum of master's degree required; Southwest. (c) Bacteriologist experienced in virology; municipal laboratories established to utilize recently developed laboratory diagnostic procedures in connection with the virus diseases; Midwest. **PH10-4** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

## Situations Wanted

### Advertisement

**HEALTH EDUCATOR**—Ph.D.; master's degree in public health; past six years, director of department of health and physical education, eastern college; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**BACTERIOLOGIST**—B.Sc., M.Sc. and D.Sc. degrees; past ten years, bacteriologist and epidemiologist, large organization, during which time he has served as associate professor of bacteriology and immunology of

university medical school; has certificate in public health administration from eastern school; for further information covering qualifications including bibliography, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

**PUBLIC HEALTH PHYSICIAN**—Year's graduate training in Hygiene, Preventive Medicine; six years' experience in public health administration; for further information, please write Burneice Larson, The Medical Bureau, Palmolive Building, Chicago 11.

## NEWS FROM THE FIELD

### POST-WAR EXPANSION OF THE A.P.H.A. EMPLOYMENT SERVICE

Readers of the JOURNAL will recognize that for many years the Association at its central office has maintained an employment exchange, where persons seeking positions might register and where employers might obtain lists of those known to be available. These facilities have resulted hundreds of times in a fruitful link being established between employer and employee, and it is encouraging to note how often state and even national lines have been overpassed in the effort to get the best person available for a particular task.

As a matter of policy, this service has been operated without charge either to the registrant or to the employer and as a public service sponsored by the Association. In spite of the substantial overhead expense, it is the current expectation that this service can be continued without charge.

Even during the years of war there has never been a time when the Employment Service was entirely without names to suggest for positions requiring candidates and now, with the turn of the tide, it is expected that the num-

ber of candidates available will rapidly increase. As before, a section of the AMERICAN JOURNAL OF PUBLIC HEALTH will be set aside for the use of the Employment Service.

All communications for the attention of the Employment Service should be addressed to 1790 Broadway, New York 19, N. Y. Applicants for registration will be supplied with regular forms in order that good coverage may be provided. Employers are asked to supply full information about the position, including the duties and responsibilities and an indication of the salary range. The selections made for listing in the JOURNAL are made with due regard for the space available and the demand for a particular kind of worker. There is no charge for these insertions to public agencies or to individuals who are Fellows or members of the Association. For others a nominal charge is made.

Miss Dorothy M. Morse is responsible for the conduct of the Employment Service under the guidance of the Executive Secretary, Reginald M. Atwater, M.D.

---

### MASSACHUSETTS PLANNING NEW DENTAL DIVISION

Plans are being laid for a new division of dental health in the Massachusetts Department of Public Health to be created on July 1, 1946. Funds for the new division will be subject to legislative approval. According to the Department, it is planned that Lt. Col. Francis B. Carroll of Waban, Mass., will become director of the division. Dr. Carroll is at present with the First Service Command. Prior to that he

served as district health officer in the Pittsfield area. Dr. Carroll graduated from Tufts Dental School and then took postgraduate work in public health at Harvard. After attending Medical School at the University of Rochester he engaged in full-time public health work with the Kellogg Foundation in Michigan. For several years he practised dentistry in Whitinsville, where he specialized in children's work.

The director and assistant director will be centrally located in Boston and

will have technical supervision over dentists and dental hygienists attached to the district offices.

The objectives of the division will be:

1. To stimulate more effective dental care of preschool and school children through official and voluntary agencies.
2. To initiate educational projects in dental health in schools, service clubs, and other organizations.
3. To assist in special field studies.
4. To inspect dental clinics.

#### A SUMMARY OF ACTIONS RELATED TO PUBLIC HEALTH DURING UNITED NATIONS CONFERENCE IN SAN FRANCISCO

Through the courtesy of Szeming Sze, M.D., of the staff of the United Nations Relief and Rehabilitation Administration, Washington, the following summary is made available of actions taken during the recent meeting of the United Nations Conference on International Organization in San Francisco. In coöperation with G. H. de Paula Souza, M.D., of Brazil, Dr. Sze was responsible for the introduction of a declaration (Appendix 5) originating in the delegations of Brazil and China which carries out the principles projected by these two gentlemen, among others, at the 1944 Annual Meeting of the American Public Health Association in New York City, where they spoke on the program "Today's Global Frontiers in Public Health."

#### MEMORANDUM ON ACTIONS TAKEN BY COMMISSION II COMMITTEE 3 (COMMITTEE ON ECONOMIC AND SOCIAL COÖPERATION)

##### RE INTERNATIONAL HEALTH COÖPERATION

1. On May 16 the Committee, in rewriting Section A of Chapter IX, included among the "purpose and relationships" of the Economic and Social Council the promotion of "solutions of economic, social, cultural, health and other related problems." (Appendix 1)
2. On May 24 the Committee, in rewriting Section C of Chapter IX, included among the "functions and powers" of the Economic and Social Council studies and reports on

international health matters and coördination of the activities of the "economic, social, cultural, health, and other specialized organizations or agencies." (Appendix 2)

3. On May 24 the Committee adopted Chapter V, Section B, paragraph 7, relating to the General Assembly making recommendations for the coördination of the policies of international specialized agencies, after adding the word "health" to include any international health agency which might be established. (Appendix 3)

4. On May 26 the Committee added to Section A of Chapter IX a new paragraph providing for the initiation of negotiations for the creation of specialized organizations or agencies. (Appendix 4)

5. On May 28 the Committee voted unanimously to associate itself with the Declaration, submitted by the Delegations of Brazil and China, proposing a general conference for establishing an international health organization. (Appendix 5)

#### Appendix 1

##### SECTION A: PURPOSE AND RELATIONSHIPS

With a view to the creation of conditions of stability and well-being which are necessary for peaceful and friendly relations among nations based on respect for the principle of equal rights and self-determination of peoples, the organization shall promote:

- a. Higher standards of living, full employment, and conditions of economic and social progress and development;
- b. Solutions of economic, social, cultural, health and other related problems, international cultural and educational coöperation; and
- c. Universal respect for, and observance of, human rights and fundamental freedoms for all without distinction as to race, language, religion or sex.

#### Appendix 2

##### SECTION C. FUNCTIONS AND POWERS OF THE ECONOMIC AND SOCIAL COUNCIL

The Economic and Social Council shall be empowered:

- (a) to carry out, within the scope of its functions, recommendations of the General Assembly;
- (b) to make recommendations, on its own initiative, for promoting respect for, and observance of, human rights and fundamental freedoms;
- (c) to make and to initiate studies and reports with respect to international economic,

social, cultural, health, and other related matters, and to make recommendations, on its own initiative, on such matters to the General Assembly, to the members of the Organization, and to specialized organizations or agencies concerned;

(d) to coördinate the activities of the economic, social, cultural, health, and other specialized organizations or agencies brought into relation with the Organization, through consultation with, and recommendations to, such organizations or agencies, and through recommendations to the General Assembly and to the members of the Organization;

(e) to obtain regular reports from the specialized organizations or agencies; to obtain reports from the members of the Organization and from the specialized organizations or agencies on the steps taken to give effect to its own recommendations and to those of the General Assembly; and to communicate its observations on such reports to the General Assembly;

(f) to perform services at the request of members of the Organization and at the request of specialized organizations or agencies with respect to economic, social, cultural, health, and other related matters, subject to the approval of the General Assembly;

(g) to call, in accordance with the rules prescribed by the Organization, international conferences on matters falling within the scope of the functions of the Council;

(h) to furnish information to the Security Council;

(i) to assist the Security Council upon its request; and

(j) to perform such other functions within the general scope of its competence as may be assigned to it by the General Assembly.

#### Appendix 3

##### CHAPTER V, SECTION B, PARAGRAPH 7

The General Assembly should make recommendations for the coördination of the policies of international economic, social, cultural, health, and other specialized agencies brought into relation with the Organization in accordance with agreements between such agencies and the Organization.

#### Appendix 4

##### CHAPTER IX, SECTION A, PARAGRAPH 2

A. The following new paragraph 2 (1) should be added:

"The Organization shall, where appropriate, initiate negotiations among the nations concerned for the creation of any specialized organization or agency required for the

accomplishment of the purposes set out above."

#### Appendix 5

##### FROM SUMMARY REPORT OF THIRTEENTH MEETING OF COMMITTEE II/3

#### International Health Conference

The Delegates of Brazil and China submitted to the Committee a declaration proposing a general conference on health, which reads as follows:

"The Delegations of Brazil and China recommend that a General Conference be convened within the next few months for the purpose of establishing an international health organization.

"They intend to consult further with the representatives of other delegations with a view to the early convening of such a General Conference, to which each of the governments here represented will be invited to send representatives.

"They recommend that, in the preparation of a plan for the international health organization, full consideration should be given to the relation of such organization to, and methods of association with, other institutions, national as well as international, which already exist or which may hereafter be established in the field of health.

"They recommend that the proposed international health organization be brought into relationship with the Economic and Social Council."

Representatives of thirteen delegations spoke in favor of the Declaration. The Delegate of France suggested that related international health organizations, as well as governments, should take part in the Conference and stated that the Delegates of Brazil and China had agreed to this. Representatives of the I.L.O. and the F.A.O. stated that their Organizations would coöperate closely with any proposed health organization.

*Decision: The Committee voted unanimously (36 to 0) to associate itself with the declaration.*

#### STREPTOMYCIN BEING STUDIED BY U. S. ARMY

According to an announcement released from the Office of the Surgeon General, U. S. Army, Washington, streptomycin, a companion to penicillin as a killer of bacteria, is being studied and is undergoing tests by the Army



Medical Department to determine its suitability as an antibiotic. Dr. Selman A. Waksman of the Department of Microbiology of the New Jersey Agricultural Experiment Station, New Brunswick, is given credit for the discovery of this drug, about which he reported some 29 years ago during experiments with soil bacteria. Streptomycin is a killer of Gram-negative bacteria. It is still in the laboratory stage but small quantities are being made available to the Medical Department for experimental purposes. It is expected that some time will elapse before the drug is available in any quantity.

#### LT. COL. WEEST APPOINTED PENNSYLVANIA SECRETARY OF HEALTH

Governor Edward Martin of Pennsylvania announced on August 20 that Lt. Col. Harry W. Weest, former Chief Surgeon of the 28th Division, U. S. Army, has been appointed State Secretary of Health, succeeding A. H. Stewart, M.D., of Indiana, Pa., who died July 31.

Dr. Weest, whose home is in Altoona, has been associated with the Governor in military circles since 1922. He is a graduate in medicine of Jefferson Medical College in 1919 and, except for his war service, has practised medicine in Altoona.

#### ALASKA ESTABLISHES A DEPARTMENT OF HEALTH

An Act establishing and defining for the first time a Department of Health, creating a Board of Health, outlining the duties of the Board, and providing for a full-time Commissioner of Health was passed by the 1945 session of the Alaska Legislature and became effective March 21.

The appointment of C. Earl Albrecht, M.D., as full-time Commissioner has been announced. Dr. Albrecht has been serving as Lieutenant Colonel in the Medical Corps of the Army and has

been placed on inactive status in order that he might accept the new position which he assumed on July 1.

The members of the Board of Health, as announced by the Governor, are as follows:

Dr. Dwight L. Cramer, Ketchikan  
Mrs. Katherine Kehoe, Nome  
Rev. R. Rolland Armstrong, Anchorage  
George Preston, Sr., Fairbanks

#### FACULTY APPOINTMENTS, SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF CALIFORNIA

The School of Public Health of the University of California has announced the appointment of three new faculty members effective July 1. W. McDowell Hammon, M.D., became Associate Professor of Epidemiology in the School of Public Health. He will be responsible for developing the training programs in epidemiology, and will continue to serve the university as Associate Professor of Epidemiology in the Hooper Foundation.

Richard A. Bolt, M.D., has been appointed Visiting Professor in Public Health. Dr. Bolt has been one of the leaders in the development of the child hygiene movement in America. Recently he retired as Director of the Cleveland Child Health Association and as a member of the faculty of the Department of Public Health and Pediatrics at Western Reserve University.

Clair E. Turner, Dr.P.H., formerly Professor of Biology and Public Health at Massachusetts Institute of Technology, and recently chief health education officer with the Coordinator of Inter-American Affairs, has been appointed Visiting Professor of Health Education and will begin his duties with the opening of the autumn semester.

The structural changes in the quarters of the School on the Berkeley campus have been completed. Provision has been made for both graduate and undergraduate instruction. Labo-

ratory and teaching facilities have been extended and modified for the training of medical laboratory technicians, public health laboratory technicians, and public health statisticians, as well as to provide for the graduate programs. In the undergraduate program enrollment has more than doubled.

The school is now offering the third special training course in sanitation for Hospital Corps Officers of the U. S. Navy under the direction of Walter S. Mangold. These Naval Officers are being given intensive training in preparation for assignments as Sanitation Officers under the Bureau of Medicine and Surgery.

#### INTER-AMERICAN HEALTH ACTIVITIES IN BRAZIL

In August, Colonel Harold B. Gotaas, F.A.P.H.A., Executive Vice-President of the Institute of Inter-American Affairs, Washington, together with Eugene P. Campbell, M.D., Chief of the Brazilian Field Party of the Institute and Einor H. Christopherson, M.D., formerly Chief of the Brazilian Field Party, participated in the dedication of seven new health centers in the Amazon Valley. These health centers have been constructed and are being operated through the Inter-American coöperative public health program under the direction of Major General George C. Dunham, M.C., U.S.A., Washington, D. C.

Major Edmund G. Wagner, member A.P.H.A., of the staff of the Institute of Inter-American Affairs, Brazil, has been in charge of an extensive program of environmental sanitation in the Amazon Valley under the direction of Colonel George H. Eagle, Chief Engineer of the Brazil office of the Institute, who recently conducted a conference on his work with a group of Brazilian physicians. The conference was organized by Dr. Beatrice Berle, member A.P.H.A., wife of Ambassador

Berle, and included various clinical and public health subjects.

#### MAJOR GENERAL DUNHAM RECEIVES DISTINGUISHED SERVICE MEDAL

The Army's Distinguished Service Medal was awarded to Major General George C. Dunham, M.C., U.S.A., in a ceremony at the office of the Surgeon General on August 9 by Major General Norman T. Kirk, the Surgeon General of the Army. The citation was read by Nelson A. Rockefeller, then Assistant Secretary of State and Former Coordinator of Inter-American Affairs.

The citation recognized General Dunham's services of an exceptionally meritorious character in a position of great responsibility between 1942 and 1945 in his capacity as Director of the Division of Health and Sanitation of the Institute of Inter-American Affairs, and later as President of the Institute. General Dunham, who is a native of South Dakota, received his M.D. at the University of Oregon in 1914 and his Doctorate in public health from Johns Hopkins in 1921. He has been a member of the Army Medical Corps since 1916. His volume, *Military Preventive Medicine*, is a standard textbook which has been translated into several languages.

Within the responsibility of General Dunham at the present time there are more than 1,000 health centers, anti-malaria and other disease control projects, food supply, medical and nutritional surveys and experimental stations in conjunction with health authorities of the Latin American republics. The present personnel includes doctors, nurses, dentists, sanitary engineers, and others to the total of about 12,000.

#### WASHINGTON STATE ADOPTS NEW STILLBIRTH CERTIFICATION

Arthur L. Ringle, M.D., the Director of Health of the Washington State Department of Health, has announced

that a new stillbirth certificate will be used after September 1 in accordance with authorization received from the Legislature. Under the new definition, all births occurring without evidence of life after the 20th week of gestation will be regarded as stillbirths. The former period was 7 months in the old law.

#### STAFF CHANGES, WASHINGTON STATE DEPARTMENT OF HEALTH

Howard W. Lundy, Dr.P.H., the Head of the Public Health Education Section in the Washington State Department of health, has announced the following changes:

A Division of Public Health Nursing with Anna R. Moore, R.N., as Chief, has been created, and a Venereal Disease Control Section with Dr. W. R. Giedt as Acting Head, and an Epidemiology Section with Dr. Giedt as Head, have been set up in the Division of Preventive Medical Services. Formerly the Public Health Nursing Division was a section under the Division of Local Health Services and the other sections were parts of the Communicable Disease Control Section.

The Mental Hygiene Section of the Department has also been transferred to the Division of Preventive Medical Services from the Division of Local Health Services and Dr. S. Harvard Kaufman has been appointed Head.

#### SENATOR PEPPER PROPOSES JOINT RESOLUTION FOR FORMATION OF INTERNATIONAL HEALTH ORGANIZATION

The following Joint Resolution (S. J. Resolution 89, U. S. Senate) was introduced on August 1 by Senator Pepper, together with Senators Wagner, Murray, Capper, Ball, and Smith. It has been referred to the Committee on Education and Labor.

WHEREAS pestilence, disease, malnutrition, and death therefrom know no frontiers; and  
WHEREAS the pressing health and medical-

social problems of the world will continue for years to come; and

WHEREAS health is essential for the well-being, progress, and prosperity of nations and for good relations between nations; and

WHEREAS the reconstruction of national and international health services and the solution of health problems would be a significant contribution to world peace; and

WHEREAS no single international health organization now exists which can coordinate effectively national and international health programs and organizations; and

WHEREAS the United Nations Conference in San Francisco adopted a recommendation to convene a conference to draw up the statutes of an International Health Organization: Therefore be it

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That there should be the speedy convening of such conference and the early formation of an International Health Organization as an indispensable bulwark of the United Nations, and that the President, on behalf of the Government of the United States, is hereby authorized to take immediate steps to hasten the convening of such conference and the formation of such an organization.

#### MASSACHUSETTS PUBLIC HEALTH LABORATORIES EXPAND

According to Geoffrey Edsall, M.D., the Acting Director of the Division of Biologic Laboratories in the Massachusetts Department of Public Health, the 51st year of the laboratory promises to be one of large expansion. The Legislature has appropriated \$174,000 to equip, staff, and operate a blood and blood derivatives program. The Godfrey M. Hyams Trust of Boston has donated \$176,000 to Harvard University for the construction of a modern, well equipped laboratory building in which processing and fractionation of blood and its products can be carried out. It is planned that separate quarters will be included in this building for the processing of tetanus toxoid as well as a modernized unit for the preparation of smallpox vaccine.

The 50th anniversary of the foundation of the Antitoxin and Vaccine

Laboratory in Forest Hills was marked in December, 1944.

#### DR. E. C. SCHNEIDER RETIRES

Edward Christian Schneider, Ph.D., Ayres Professor of Biology at Wesleyan University, Middletown, Conn., has retired, having reached the age of 70. Dr. Schneider, author of the volume, *Physiology of Muscular Activity*, has published many papers on altitude and aviation studies. Formerly Professor of Biology at Colorado College, he joined the A.P.H.A. when it met in Colorado Springs in 1913, and has been noted for having introduced hundreds of men and women as undergraduates to the opportunities of careers in medicine and public health.

#### DR. BRISTOL APPOINTED COMMISSIONER OF HEALTH AND WELFARE IN MAINE

Governor Hildreth of Maine has announced the appointment effective August 15 of Leverett D. Bristol, M.D., Dr.P.H., of New York City, as Commissioner of Health and Welfare in the State Department of Health and Welfare, Augusta. Roscoe L. Mitchell, M.D., will continue as Director of the State Bureau of Health under Commissioner Bristol where he has served since 1939.

A graduate in medicine of Johns Hopkins University Medical School, Dr. Bristol holds the doctorate in public health from Harvard and most recently has served as Director of Health with the American Telephone and Telegraph Company, New York City. Previous to that he was Director of the Bellevue-Yorkville Health Demonstration in New York City and of the Cattaraugus County Department of Health, Olean, N. Y.

#### PROPOSED STATE HEALTH CENTER AT COLUMBUS, OHIO

*Science* announces that a proposal is now before Governor Frank J. Lausche of the State of Ohio and members of

the legislature for the erection of a State Health Center at the Ohio State University. An appropriation of five million dollars is requested to cover the cost of the center as the result of two years of planning and study by members of the medical and dental faculties and by representatives of these professions. The proposed center has been approved by official representatives of the medical colleges of Western Reserve University and the University of Cincinnati. It has also been approved by the Inter-University Council, which includes representatives of the six state universities—Bowling Green, Kent, Miami, Ohio, Ohio State, and Wilberforce.

Joining also in active support of the project are dental, medical, and nursing alumni of the Ohio State University, under the chairmanship of Dr. Russel G. Means, Columbus.

#### WESTERN RESERVE REORGANIZES ITS TEACHING IN PUBLIC HEALTH

The present reorganization of the teaching in public health at Western Reserve recalls the fact that the Department of Hygiene and Bacteriology at the Medical School was established in 1910, splitting off from the Department of Pathology. The establishment of a chair of Preventive Medicine in that year by Western Reserve followed by a few months similar action at Harvard, and Western Reserve thus became the second medical school to have a chair of Preventive Medicine. The first incumbent of the chair was the late Dr. Roger Griswold Perkins, who occupied the position from 1910 until his retirement in 1930.

Dr. James A. Doull was appointed Professor of Hygiene and Public Health and head of the Department of Hygiene and Bacteriology in 1930 and he has served continuously since that time. As of July 1, 1945, this Department was split into a Department of Pre-

ventive Medicine and Public Health and a Department of Bacteriology. Dr. Doull was named Director of the former and Acting Director of the Department of Bacteriology until a director is appointed. The Department of Bacteriology will have responsibility for teaching of bacteriology, parasitology, and viruses. The Department of Preventive Medicine will be responsible for preventive and social medicine and public health.

The interest of Western Reserve University in the Elizabeth Severance Prentiss Trust has been allocated to the Department of Preventive Medicine and Public Health. The capital value of this endowment is stated to be approximately \$600,000 and the present annual income \$24,000. Additional budget will be provided by the University. The chair of Preventive Medicine has been named The Elizabeth Severance Prentiss Chair of Preventive Medicine.

#### TEACHERS LOSE COURT CASE AGAINST REQUIRED CHEST X-RAYS

A recent decision of the New York State Supreme Court Justice Mr. Swezey has been announced in the case brought against the New York City Board of Education and the New York City Department of Health by a Joint Committee of Teachers Organizations in New York City which denies their request for an injunction to restrain the Board of Education and the Health Department from enforcing the regulation to require teachers to have a chest x-ray every two years. Regulation 19(a) of section 20 of the Sanitary Code adopted by the Board of Health of the City of New York requires teachers and other employees who work in the schools and come in contact with the children to procure biennially a certificate from a physician or from the Board of Health based upon a chest x-ray examination and certify-

ing that such employee is free from active tuberculosis.

The teachers contended that the Board of Health was not empowered to enact such a regulation, that the regulation, in addition to being beyond the scope of the Board's powers, is arbitrary, capricious, and unreasonable and contrary to the constitution and laws of the United States and of the State of New York. It was contended that the regulation denied equal protection of the law to the persons directed to submit to such examination and that it was discriminatory in that it is applicable to no other person or group of persons who come in contact with children, or indeed whose work places them in frequent contact with persons who may be infected with the disease. These claims were denied by the Board of Health.

Mr. Justice Swezey has concluded that the Legislature has properly delegated the power to regulate the public health to the Department of Health of the City of New York within certain limitations.

"There is no question but that the regulation in question is necessary for the protection of the public health of the people of the City of New York. Respondents' affidavits disclose that the contacts between the teacher and the school-child, often intimate, greatly increase the hazard of infection if the teacher should be an open case of pulmonary tuberculosis. Respondents' affidavits also disclose that tuberculosis is not a disease that is readily apparent to the eye, nor is it easily recognizable on the basis of symptoms. It may exist for a long time without any outward manifestation in the victim. Under the circumstances the regulation is not arbitrary or capricious but rather a reasonable exercise of the power vested in the Board of Health to protect the public health."

"Petitioner's further argument that the regulation is discriminatory and unconstitutional in that it applies only to school teachers and school employees is also untenable. There is no constitutional prohibition against class legislation as such if the classification is based upon some reasonable ground and it is not essentially arbitrary."

"... There remains for consideration the question whether or not this regulation invades the petitioner's constitutional rights and privileges. Where, as here, the choice must be made between the individual rights of the teacher on the one hand, and health of school children generally, on the other, I am of the opinion that the teacher's rights must yield to the common good. In this connection our courts have consistently held that the natural right to life, liberty, and the pursuit of happiness is not an absolute one but that it must yield if the sacrifice is necessary in order that organized society as a whole is to be benefited."

#### CITY SURVEYS BY URBAN LEAGUE

The National Urban League, which is concerned with the life of the Negro in America, has developed a community relations project which recently has been surveying several cities including Gary, Ind., New London, Conn., Dayton, Ohio, Houston, Tex., and Oklahoma City. Studies are made and reports issued covering employment, housing, health, education, recreation, Negro-white coöperation, and planning in community welfare and race relations. The National Health Council, New York, N. Y., of which the A.P.H.A. is a constituent member, is coöperating with the Urban League, giving advice on health services. Paul B. Cornely, M.D., Professor of Public Health at Howard University School of Medicine, Washington, is the health consultant working with the group.

#### SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH, NEW YORK

The Alfred P. Sloan Foundation has announced a gift of \$4,000,000 to provide and to maintain a proposed Sloan-Kettering Institute for Cancer Research. The Institute will be related to Memorial Hospital for Cancer in New York City and will provide a building to be erected at a cost of \$2,000,000 on the property adjoining Memorial Hospital. It has also been announced that the hospital plans to launch a public campaign to raise about

\$4,000,000 to provide for an increased bed capacity at Memorial Hospital, for fellowships for the training of specialized medical personnel, and for equipment necessary for the new James Ewing Hospital for Cancer to be erected at the center by the City of New York.

#### NEW OKLAHOMA BOARD OF HEALTH FORMED

On June 15 the Governor of Oklahoma appointed a new nine member State Board of Health, created under the recently enacted house bill number 77, which stipulated that the new board be composed of a representative from each congressional district and one from the state at large, five to be members of the Oklahoma State Medical Association.

Officers are Dr. Charles R. Rountree Chairman; Dr. Charles Edgar White Vice-Chairman; and Bert Loy, Secretary. At the organization meeting on June 22, Dr. Grady F. Mathews of Oklahoma City was unanimously asked to continue as State Health Commissioner.

#### NEW YORK STATE ADOPTS POLLUTION ABATEMENT RESOLUTION

At a recent meeting of the New York State Joint Legislative Committee on Interstate Cooperation, it was estimated that the job of cleaning up the waters in this area is about 50 per cent completed. The following resolution was unanimously adopted, expressing the sense of the Committee:

WHEREAS: Pollution abatement in state and interstate waters is rightly considered a major post-war responsibility both from a conservation and from a health standpoint, and

WHEREAS: The problem, if it is to be adequately dealt with by the states, will require expansion and amplification of state laws, such as the Commonwealth of Pennsylvania, in pursuance of interstate coöperation, adopted at the last session of its legislature; now therefore be it

RESOLVED: That the New York Joint Legislative Committee on Interstate Cooperation

join with the Post-war Planning Commission, the Interstate Sanitation Commission, the Department of Conservation, and all other interested state agencies, with a view to formulating a complete program of pollution abatement in this state; and be it further

RESOLVED: That in this connection the feasibility of using state aid to expedite pollution abatement in this state be studied.

#### MICHIGAN STATE HEALTH DEPARTMENT CREATES NEW PENINSULA OFFICE

Dr. Wilbert J. M. Menke, a member of the teaching staff of the University of Michigan School of Public Health and of the School of Medicine, has been appointed by the State Health Commissioner as Director of the upper peninsula office of the Michigan Department of Health. The new office was created by the 1945 legislature and will have offices at the Pinecrest Sanatorium, Powers, Mich.

*Michigan Public Health* reports that the new office was established to make possible a more effective public health program. The 13 county health departments in the upper peninsula have operated in the past without the immediate assistance and supervision of the State Health Department. They have been isolated from the central office in Lansing by distance and from one another by a lack of coordinating supervision. Two counties do not have health departments.

#### STATE-WIDE TUBERCULOSIS PROGRAM IN SOUTH CAROLINA

The Industrial Committee of the South Carolina Tuberculosis Association plans to photofluorograph all industrial employees in the state. Results will be checked and cooperation will be extended to place employees in sheltered work as well as to assist private physicians in the isolation of infectious cases of tuberculosis. The program was adopted from an x-ray survey carried on by the State Board of Health. The program will work through the county

health departments and tuberculosis associations and with the full assistance of the consultant nurses of the Industrial Hygiene Division.

#### WEST VIRGINIA HAS NEW PROCEDURE IN APPLICATION FOR CANCER TREATMENT

Needy cancer patients may now apply for treatment and care through county, district and city health departments under a new setup announced by Dr. Paul R. Gerhardt, Director of the West Virginia State Division of Cancer Control. The new procedure follows the recommendations of the Public Health Council and the Cancer Committee of the West Virginia State Medical Association that further case referral sources be developed. Heretofore all applicants had been referred through the County Department of Public Assistance.

Evidence must be submitted to show that there has been a diagnosis of cancer, and that the patient is unable to pay for treatment and care. One of the new forms to be used in submitting the information must be signed by the applicant and the referring agency and must be filled out by the city, county or district public health officer or public health nurse. Applications for care may also be filed with the Local Department of Public Assistance. The second form, which is a medical report of the case, is to be filled out by the patient's physician without charge to the division. Both forms should be sent to the Division of Cancer Control, 1719 East Washington Street, Charleston, since no disposition of a case can be made until both types of information have been received on form CA-1 and form CA-2. The division will notify the patient whether the application can be accepted and where to report for treatment. A copy of the notice will be sent to the referring agency. A patient will be referred to the nearest of 12 treatment

centers in the state. The Division of Cancer Control cannot pay transportation cost, and local resources should be utilized if the patient or the family is unable to assume responsibility.

#### VETERANS' PSYCHIATRIC SERVICE

A Veterans' Psychiatric Service has been established at the Veterans' Information Center, New Orleans, under the sponsorship of the Louisiana Society for Mental Health. The service will be available for the benefit of mentally disturbed veterans who cannot afford the cost of the services of a private psychiatrist. Dr. Milton E. Kirkpatrick, New Orleans, is Clinical Director with Dr. Walker Thompson, New Orleans, and Major H. Halbert Leet, M.C., assisting him.

#### COMMUNICABLE DISEASE CONTROL ORDINANCE ENACTED

An ordinance has been enacted by the City Council of Baltimore, Md., to strengthen the program of the City Health Department to prevent communicable diseases in Baltimore. The ordinance authorized the Commissioner of Health to make and adopt rules and regulations to prevent and control the spread of communicable diseases and to provide punishment for any violations.

#### \$100,000 FOR CANCER RESEARCH IN PENNSYLVANIA

The Pennsylvania State Department of Health will receive \$100,000 or what part of the sum may be needed to conduct cancer research to determine the cause, mortality rate, methods of treatment, prevention and cure of cancer and allied diseases, including the nature and extent of the facilities available in the counties and cities of the state for the diagnosis and treatment of these diseases. The appropriation was provided for in a bill recently signed by Gov. Edward Martin.

#### SOUTHWESTERN DISTRICT HEALTH UNIT ESTABLISHED IN NORTH DAKOTA

Establishment of another full-time district health unit in the State of North Dakota was announced by Dr. G. F. Campana, state health officer. This district health unit is located in the southwestern area of the state, and will be known as the Southwestern District Health Unit. It is comprised of the counties of Golden Valley, Billings, Slope, Bowman, Hettinger and Adams.

The district board of health, governing agency, includes M. S. Byrne, Bowman, president; Clara Brown, Amidon; Dr. L. S. Riley, New England; Lewis Odland, Beach; A. E. Boicourt, Medora, and Dr. J. L. Dach, Hettinger.

Mary Soules, M.D., M.P.H., Dickinson, was appointed district health officer by the board, which also selected New England as the headquarters for the district health unit.

#### INTERNATIONAL NURSING BULLETIN

The International Council of Nurses announces the publication of *The International Nursing Bulletin*, a four page successor to *The International Nursing Review* which was suspended in 1939 due to the war. The first issue of the *Bulletin* will appear in October 1945, and will be complimentary. It will be published quarterly from then on, and will be increased in size and scope until it becomes a review of professional literature for its international subscribers.

#### APPOINTMENTS TO MISSOURI STATE BOARD OF HEALTH

Governor Phil M. Donnelly has made the following appointments to the State Board of Health for four year terms: Drs. George E. Knappenberger, Kansas City, to succeed Ira H. Lockwood, Kansas City; Frank H. Rose, Albany, to succeed John I. Byrne, St. Joseph, and Ralph A. Kinsella, St. Louis, to succeed Cleveland H. Shutt, St. Louis.



Other members of the Board include Drs. Robert M. James, Joplin, recently appointed State Commissioner of Health; Charles H. Neilson, St. Louis; Howard B. Goodrich, Hannibal, and Hardin M. Henrickson, Poplar Bluff.

#### SCHOLARSHIPS IN PUBLIC HEALTH

The West Virginia Health Department has announced that four scholarships in public health will be offered successful applicants, who will receive nine months' postgraduate training at the School of Public Health at the University of North Carolina, leading to a degree of Master of Public Health Education. Field training for a period of three months will follow, during which applicants will receive a monthly stipend of \$100. Full travel expenses will be allowed during the period of field training.

Applicants must be college graduates, and scholarships will be awarded to those who evince a sincere desire to make public health their career. Many positions as public health educators are now available as a result of the rapid expansion in the field of public health in the state.

#### BRONZE STAR MEDAL TO MAJOR ISRAEL WEINSTEIN

Major Israel Weinstein, M.C., A.U.S., whose home is in New York City but who has been serving with the 71st Infantry Division in the European Theater, was awarded the Bronze Star Medal on August 2 "For meritorious service in combat . . . in France, Germany and Austria. As Division Medical Inspector Major Weinstein gave unstintingly of his effort to supervise the health and sanitation of front line troops. He unhesitatingly and with complete disregard of his own safety rode through woods occupied by enemy snipers to reach his destination. On the 26th of April on the north shore of the Danube between Regensburg and

Donauworth, while on his way to see that a satisfactory water point was set up for an advanced detachment of soldiers, he came under heavy mortar fire. Both he and his driver were wounded. His first concern was to give medical aid to the wounded driver. Major Weinstein's ceaseless effort in guarding the health and welfare of the troops has brought credit to himself, and reflects the highest tradition of the Armed Forces."

#### CHICAGO CONFERENCE ON TUBERCULOSIS

The Institute of Medicine of Chicago has announced a conference on the control of tuberculosis in a metropolitan area to be held Tuesday and Wednesday, November 13 and 14, at the Palmer House, Chicago, covering phases of particular interest to clinicians, lay workers, and teachers, all of whom are invited to attend.

On the program are four panel discussions, Financing the Tuberculosis Problem, The Problem of the Tuberculous War Veteran, Immunization with the Bacillus Calmette-Guerin, and Education of Medical Students and Physicians in Tuberculosis.

#### HEALTH DEPARTMENT CELEBRATES TWENTY-FIFTH ANNIVERSARY

The Charleston County (S. C.) Health Department observed its twenty-fifth anniversary recently. Dr. Leon Banov, Health Officer, has held the position since the department was organized. In 1926, the County and City Health Departments were merged and ten years later the City Department was abolished, giving the county group charge of health for both the city and county of Charleston.

#### LIBRARY OF PUBLIC HEALTH EDUCATION IN WEST VIRGINIA

For the first time in the history of the West Virginia State Health Department, a reference and lending library

has been established in the Bureau of Public Health Education in line with similar action taken by the health departments of many other states. For the present the library will be maintained for the use of the personnel of the State Health Department, but eventually it is planned to make the facilities available to the physicians in West Virginia.

## PERSONALS

### Central States

WILLIAM E. BROWN, M.D.,<sup>†</sup> has resigned as Professor of Preventive Medicine at the College of Medicine University of Cincinnati, to accept appointment as Dean of the Medical School at the University of Vermont, Burlington.

OSCAR FELSENFELD, M.D., C.P.H.,<sup>†</sup> and VIOLA MAE YOUNG, M.S.,<sup>†</sup> resigned from their positions as Associate Professor and Instructor, respectively, with the Chicago Medical School, in order to join the staff of the Mt. Sinai Medical Research Foundation, which was recently established under the directorship of Dr. I. Davidson. Both will continue their work in enteric microorganisms.

RUTH CRAMER FRANTZ, M.P.H.,<sup>†</sup> Milwaukee, Wis., has been appointed Director of the West Virginia Bureau of Public Health Education, Charleston, effective August 15. She is a graduate of the University of Michigan.

CHARLES F. MCKHANN, M.D.,\* Detroit, who for some years has been assistant in charge of research to the President of Parke, Davis & Company, has resigned to accept appointment as Professor of Pediatrics at the School of Medicine of Western

Reserve University, Cleveland, Ohio, and Director of Pediatrics at University Hospital.

### CHANGES IN HEALTH OFFICERS IN MICHIGAN:

JOSEPH A. MURPHY, M.D., was recently appointed Health Officer of Whitehall.

ALBERT E. HEUSTIS, JR., M.D.,<sup>†</sup> has been named Director of Branch County with headquarters in Coldwater, succeeding DR. IRA O. CHURCH,\* who resigned to go to California.

JOHN J. ANGEL, M.D., has been appointed Village Health Officer of Wayne.

FRANK S. STAFFORD, M.S.,<sup>†</sup> has resigned from the staffs of the Indiana State Departments of Health and Education to become Specialist for Health and Physical Education, Division of Secondary Education of the U. S. Office of Education, Washington, D. C. Mr. Stafford is also Chairman of the Office of Education Committee on Health and Physical Education.

### Eastern States

FLORENCE C. AUSTIN,<sup>†</sup> Director of the Public Health Nursing Organization of Eastchester, has been appointed to the administrative staff of the Visiting Nurse Association of Brooklyn as Second Assistant Director, as of September 10.

CHARLES M. CARPENTER, PH.D.,\* Rochester, N. Y., of the Department of Bacteriology and Public Health, University of Rochester School of Medicine and Dentistry, has left on a special mission to the Philippine Islands under the auspices of the Office of Scientific Research and Development, to make an investigation of venereal diseases.

MERRILL E. CHAMPION, M.D.,\* former epidemiologist in the Massachusetts Dept. of Public Health, is

\* Fellow A.P.H.A.  
† Member A.P.H.A.

now Acting Director of the Division of Communicable Disease.

CAROLINE A. CHANDLER, M.D.,† has been appointed as Supervisor of Clinics for Crippled Children in Services for Crippled Children of the Massachusetts Dept. of Public Health. Prior to accepting a commission in U. S. Public Health Service, Dr. Chandler was with the Division of Research in Child Development in the Children's Bureau.

A. LAURENCE CORBMAN, D.D.S.,† formerly Associate Dental Surgeon with the Office of Indian Affairs of the U. S. Department of the Interior in South Dakota, has been appointed Public Health Dental Supervisor with the Massachusetts Dept. of Public Health. He is assisting in a dental caries study authorized by the recent Legislature in which the use of fluorine for reducing caries among school children is being investigated.

ROY F. FEEMSTER, M.D.,\* was appointed Director of the Division of Local Health Administration in the Massachusetts Dept. of Public Health. He will retain this office for the duration, after which he will return to his former position of Director of the Division of Communicable Disease.

ALBERT D. KAISER, M.D.,\* Professor Child Hygiene at the University of Rochester School of Medicine, Rochester, N. Y., and Commissioner of Health of Rochester, has been awarded the Rochester Civic Medal by the Museum Association. He has also been elected for a three year term to the Board of Trustees of the Rochester Academy of Medicine.

#### Southern States

COLONEL JUSTIN M. ANDREWS, SN.C.,\*  
Chief Malariologist for the Mediter-

anean Theatre of Operations, who has returned to the United States from service overseas in Africa and Italy, has been awarded the Legion of Merit, as announced by the U. S. Army. Prior to his Army service, Dr. Andrews occupied the position of Director of the Malaria Investigations Service in the State Department of Health, Atlanta, Ga.

COLONEL JAMES W. BASS,\* serving with the Medical Corps as Chief of the Preventive Medicine Service, Office of the Chief Surgeon, Manila, Philippines, has been awarded the Legion of Merit for exceptionally meritorious achievement in the performance of outstanding services in the Southwest Pacific area. The Colonel was one of the officers who received credit for reducing the incidence of malaria in New Guinea by 95 per cent within a few months. Before assignment to military duty in 1941, Colonel Bass was the Director of Public Health of Dallas, Tex.

EUGENE P. CAMPBELL, M.D.,\* who has been serving with the Institute of Inter-American Affairs in the Washington office, has been assigned as Chief of Field Party for the Institute for Brazil, and his address is now Caixa Postal 1530, Rio de Janeiro. Dr. Campbell succeeds DR. EINOR H. CHRISTOPHERSON.

DAVID GRADY DEATON, M.D., of Houston, Tex., has been appointed full-time Director of the Harris County Public Health Unit.

ROSIER D. DEDWYLDER, M.D., of Cleveland, Miss., on July 1 completed 25 years' service as Director of the Bolivar County Health Department.

E. C. FAUST, PH.D., who is acting head of the Department of Tropical Medicine at Tulane University, New Orleans, is at present heading a special mission to study tropical diseases in the Southwest Pacific under the aus-

\* Fellow A P H A

† Member A P H A.

pices of the Surgeon General of the U. S. Army.

ROBERT P. FISCHELIS, PHAR.D., SC.D.,\* Washington, Secretary of the American Pharmacèutical Association, received the degree of Doctor of Science, honoris causa, from the Philadelphia College of Pharmacy and Science at its 124th annual commencement on July 24, recognizing his contributions to pharmacy and in particular through the War Production Board with which he has been associated.

CHARLES J. FISHER, M.D.,† formerly Health Officer of Tuscaloosa County, Ala., has been named to a similar position in Lauderdale County.

WILLIAM W. FRYE, M.D.,† Professor and Head of the Department of Preventive Medicine and Public Health, Vanderbilt University School of Medicine, Nashville, Tenn., has been granted a 6 months' leave of absence to serve on a special commission sent to China by the UNRRA to study the current cholera epidemic there, it is reported. During Dr. Frye's absence, DR. ALVIN E. KELLER\* will be Acting Head of the Department of Preventive Medicine and Public Health.

FLORENCE F. GOODRICH, M.S.,† of Nashville, Tenn., after spending a year studying at the University of Michigan School of Public Health, has accepted a position as Professor of Health Education at Winthrop College, Rock Hill, S. C.

WILLIAM C. HATCHETT, M.D., formerly of Huntsville, Ala., has been appointed Local Health Officer of the Broward County Health Unit with headquarters at Ft. Lauderdale, Fla.

SYDNEY E. LANGER, M.D., U. S. Public Health Service, has been appointed Health Officer of Calhoun County,

Ala., to succeed the late DR. ARTICE E. CULBERTSON of Anniston.

JOHN J. PHAIR, M.D., DR.P.H.,\* of the Department of Epidemiology at Johns Hopkins School of Hygiene and Public Health, Baltimore, Md. (at present absent in Germany on an Army mission), has been appointed Head of the Department of Public Health, University of Louisville School of Medicine and Director of the Louisville and Jefferson County Board of Health, Kentucky, effective January 1. Dr. Phair will succeed HUGH R. LEAVELL, M.D., DR.P.H.,\* who will become Associate Director for the Medical Sciences, Rockefeller Foundation, New York City, on his return from Europe.

CHARLOTTE SILVERMAN, M.D.,† is now with the Massachusetts Dept. of Public Health as Epidemiologist in the Division of Communicable Disease. Prior to her appointment Dr. Silverman was Senior Assistant Surgeon (R) with U. S. Public Health Service at the National Institute of Health, Bethesda, Md.

LELAND EDSON STARR, PH.D., has been appointed State Rabies Control Supervisor with the Georgia Department of Public Health, effective July 12. Dr. Starr will assist counties in setting up local organizations for rabies control, in accordance with the new rabies control law which requires vaccination of all dogs.

BERTHA A. C. WISEMAN, M.D.,† of La Grange, Ky., Health Director of Oldham County, has been assigned to the Shelby County Department of Health temporarily until a full-time director can be named to succeed Dr. MARTIN H. SKAGGS, resigned.

WILLARD H. WRIGHT, PH.D.,\* Chief of the Zoölogical Laboratory at the National Institute of Health, Bethesda, according to *Science* has been assigned for temporary duty and detailed to the Surgeon General of

\* Fellow A.P.H.A.

† Member A.P.H.A.

the Army for overseas service as a member of the special commission to study schistosomiasis in the Southwest Pacific Area.

### Western States

GLENN A. CARMICHAEL, M.D., Butte, Mont., has been appointed Director of the Division of Maternal and Child Hygiene of the West Virginia State Department of Health.

L. T. COGGESHALL, M.D., M.C., U.S.N.R.,\* was recently promoted to the grade of Captain and is assigned to the Marine Barracks at Klamath Falls, Ore.

WARREN H. GARDNER, Ph.D.,† San Mateo, Calif., has been appointed Professor of Hearing and Speech Therapy at Western Reserve University School of Medicine and Director of Clinical Services of the Cleveland Hearing and Speech Center, effective September 1. Dr. Gardner has been associated with the California State Department of Public Health and has been conducting tests on school children of the state.

JACOB C. GEIGER, M.D.,\* Director of Public Health of the City and County of San Francisco, Calif., was recently awarded the decoration of the Orden de Vasco-Nunez de Balboa, grade of Knight Commander, for services to Panama.

PAUL A. LINDQUIST, M.D.,† has been appointed Health Officer of Walla Walla County, Wash. He succeeds Dr. ARTHUR L. RINGLE,† who recently became State Health Commissioner with offices in Seattle.

WALTER L. TREADWAY, M.D., Los Angeles, Calif., formerly Assistant Surgeon General, U. S. Public Health Service, recently received the honorary degree of Doctor of Science from the University of Southern California.

L. H. WALKER, D.O., Health Officer of Ellensburg, Wash., has been named to succeed Dr. ROBERT H. WELDING who has resigned as Health Officer of Kittitas County.

### Foreign

ISMAEL G. CARMONA, D.D.S., Santiago, Chile, who has been a student at the University of Michigan School of Public Health in dental health, visited the offices of the American Public Health Association and the National Health Council in August.

ROGELIA ORTIZ, D.D.S., Asuncion, Paraguay, who has been a student at the University of Michigan School of Public Health in dental health, visited the offices of the American Public Health Association and the National Health Council in August.

### Deaths

COLONEL CHARLES F. DAVIS, M.C., U.S.A. Ret., Superintendent of the Parsons State Hospital, Parsons, Kans., died July 26, 1945. He received the M.P.H. degree from Johns Hopkins in 1940 and served 28 years in hospitals of the U. S. Army.

DR. HENRY R. KENWOOD, Emeritus Professor of Hygiene and Public Health, University of London, England, died June 7, aged 82.

SMITH L. TURNER, M.D.,† Local Health Officer of the Levy County Health Unit in Florida, died recently following a major operation.

**A HELPING HAND  
FOR BUSY  
HEALTH OFFICERS**



**DIXIE CUPS**

\* Fellow A.P.H.A.

† Member A.P.H.A.

# American Journal of Public Health

## *and* THE NATION'S HEALTH

---

Volume 35

November, 1945

Number 11

## Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea\*

FRANCIS G. BLAKE, M.D.,† KENNETH F. MAXCY, M.D.,  
DR.P.H., F.A.P.H.A.,‡ JOSEPH F. SADUSK, JR., COLONEL,  
M.C., AUS, GLEN M. KOHLS, MAJOR, SN.C., AUS, AND  
E. JOHN BELL, CAPTAIN, SN.C., AUS

THE Japanese were driven out or destroyed in the vicinity of Buna and Gona, New Guinea, in November and December of 1942. This area then became a base for the operations as the fighting progressed up the coast to Wau, Salamana, Lae, Finschaven, the Markham River valley, and the Ramu River valley toward Madang during 1943. As new units moved in, the casualties from disease mounted. The principal cause of disability was, of course, malaria. Secondary to this, but more disturbing, was a typhus-like disease with which the

Army Medical Corps had had no previous experience. Before the war it had been described under the name "scrub typhus" as occurring in North Queensland and as "endemic typhus" in New Guinea. By the end of the summer of 1943 there had been more than a thousand admissions for this cause to the Australian Army Hospitals and an equivalent number to the U. S. Army Hospitals. Throughout the subsequent operations "scrub typhus" has been a far more important problem to military forces in the southwest Pacific than has the classical and better known epidemic—or louse-borne—typhus to the forces in the Mediterranean and European theaters.

As a result of a request from the Commanding General, S.W.P.A., in August, 1943, the Surgeon General of the Army authorized the formation of a special commission to investigate "scrub typhus" in New Guinea under the auspices of the United States of America Typhus Commission and the Board for the Investigation and Control of Influenza and Other Epidemic Dis-

\* Special Review Article, prepared at the request of the Editorial Board.

This is a summary account of investigations which were carried out under the auspices of the United States of America Typhus Commission, War Department, and the Board for the Investigation and Control of Influenza and other Epidemic Diseases, Preventive Medicine Service, Office of the Surgeon General, U. S. Army, Washington, D. C.

† Consultant to the Secretary of War and President of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army; Professor of Medicine and Dean, Yale University School of Medicine, New Haven, Conn.

‡ Consultant to the Secretary of War and member of the Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army; Professor of Epidemiology, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

eases. This Commission left the United States in the latter part of September and established a field laboratory on the north coast of New Guinea near Buna adjacent to the Third Medical Laboratory. The first phase of the field studies was completed in December, 1943. Four members of the Commission returned to the United States, bringing several strains of the causative agent of "scrub typhus" in inoculated white mice. Laboratory studies were continued in the Division of Virus and Rickettsial Diseases of the Army Medical School. It is proposed here to present a summary of this first phase of the investigation. A detailed report is in process of publication elsewhere.<sup>1</sup> The field studies were continued by Kohls, Armbrust, Irons, and Philip.<sup>2</sup>

The objective of the Commission was to contribute to knowledge of "scrub typhus" in New Guinea with regard to (1) its relation to other typhus-like fevers encountered in this part of the world, (2) its clinical course, differential diagnosis, pathogenesis, and rational therapy, (3) its specific etiology, (4) the circumstances under which exposure to infection occurred, together with the identity of the vector and the reservoir host, and (5) its prevention through reduction in exposure or through artificial immunization or both. In this undertaking there was available, scattered through medical literature, a considerable amount of pertinent information, and the Commission had the advantage of experience already gained by officers serving in this area, much of which has since then appeared in published form.<sup>3-10</sup>

#### REVIEW

From a critical review of the literature which appeared before the war, it appeared that the disease commonly known as tsutsugamushi (kedani, flood or river fever) by the Japanese was not limited in its occurrence to certain river

valleys of Honshu and parts of Formosa and the Pescadores, where it had been extensively studied by the Japanese. Under many different names,<sup>11</sup> such as "tropical typhus," "rural typhus," "Indian tick typhus," "mite fever," and "scrub typhus," a typhus-like disease—similar to, if not identical with, tsutsugamushi—was described in localities scattered throughout southeastern Asia and the adjacent islands in the Indian Ocean and southwest Pacific, and in the coastal area of North Queensland, Australia.

A fundamental differentiation was introduced in 1929 by the studies of Fletcher, Lesslar, and Lewthwaite<sup>12</sup> in the Federated Malay States. These investigators found that sera from patients who had the "urban" form of typhus in that country exhibited a positive Weil-Felix reaction with the ordinary indologenic strains of *Proteus* X<sub>19</sub>. On the basis of clinical course, epidemiology and laboratory observations, they concluded that they were dealing with the murine flea-borne typhus which is endemic in the southeastern United States. On the other hand, sera from patients who had the "rural" form of typhus were consistently negative with *Proteus* OX<sub>19</sub>, but became positive with an indologenic strain of *Proteus* named after Dr. A. N. Kingsbury, OXK. It was further recognized that the epidemiology of this rural form of tropical typhus was similar to that of tsutsugamushi disease in Japan. Since the Japanese had regarded the presence of a primary lesion or eschar at the site of the infective mite bite as pathognomonic and had reported a high case fatality rate as clinically characteristic, Fletcher and his associates in the Federated Malay States divided the cases of rural or "K" typhus into two groups—one with the eschar being recognized as probably identical with tsutsugamushi disease, and the other, without the eschar and with a low fatality rate, as

being "scrub typhus." They were followed in this differentiation by the Dutch investigators in Sumatra. Ultimately, Lewthwaite and Savoor<sup>13</sup> and Kouwenaar and Wolff<sup>14</sup> concluded that an etiological differentiation between the two clinical syndromes was not justified. Experimental inoculation of susceptible animals proved that both were due to the same agent, identical with<sup>13</sup> or closely related to<sup>14</sup> *Rickettsia orientalis* (Nagayo, et al., 1930) which the Japanese investigators had established as the specific cause of tsutsugamushi disease.

In reports from different geographic areas there appears to be some variation in the clinical manifestations of this rickettsial disease, particularly with regard to the frequency with which the primary lesion, or eschar, is found and with regard to severity or case fatality rate. These variations are no greater than those which have been observed in Rocky Mountain spotted fever or classical louse-borne typhus as they have prevailed at different times and in different places. Although a crucial test has not been made of the cross-immunity afforded by strains originating from patients with tsutsugamushi disease on the Island of Honshu in Japan, and strains originating from patients with "scrub typhus" or "mite fever" in the infected localities of southeast Asia or the southwest Pacific, there is no valid evidence at present available which justifies belief in specific etiological difference. On the contrary, all the differences which were observed could readily be explained as due to variation in strains of *R. orientalis* or variation in specific host relationships, with reference to mite species, rodent species, and the characteristics of human races which are exposed.

Japanese investigators proved, by extensive experiments with animals, that the vector of tsutsugamushi disease in Japan, Formosa, the Pescadores Islands

and possibly other areas, is a mite like our "chigger" or "red bug," specifically named *Trombicula akamushi*. Considerable evidence has been advanced to incriminate a closely related form, *T. deliensis*, in Sumatra, Federated Malay States, India, and Queensland, Australia. Up to the present the crucial proof afforded by recovering *R. orientalis* in experimental animals from specimens of *T. deliensis* has not been offered, although a suggestive result was obtained in one experiment with a gibbon by Walch and Keukenschrijver.<sup>15</sup> Other species of mites have been suspected by various investigators.<sup>16</sup>

In Japan *T. akamushi* is parasitic, during the larval stage, upon a field vole, *Microtus montebelloi*. This rodent has been found to be naturally infected with *R. orientalis*. The distribution, numbers, and habits of these voles are consistent with the hypothesis that they serve as the principal reservoir host on Honshu. In the Federated Malay States a wild rat (species undetermined), which is numerous in the infected localities, has been found infected in nature. Other species of rats and bandicoots have been suspected of being implicated in the maintenance of the disease in various geographic areas, but up to the present no other animal host has been definitely incriminated by recovery of *R. orientalis* from the tissues of captured specimens.

The developmental cycle of the mite vector of tsutsugamushi disease, *T. akamushi*, was worked out by Japanese investigators. The minute yellowish-red, barely visible, unfed, six-legged larval form lives in the upper layers of the soil. Under favorable conditions of temperature and moisture, it crawls about, climbing on blades of grass a few inches above the ground, seeking contact with a warm-blooded animal. If successful in this search, it makes its way over the skin of the animal until it finds a favorable site of attachment. Its



chelicerae are inserted into the skin. Food is obtained through a tubular structure, variously called the "hypostome," "stylostome," "rostral tube," or "sucking tube," which is thought to be formed as a result of the reaction of the secretions of the mite with the host tissue.<sup>17</sup> Two to 5 days are required for engorgement with serum. After feeding, the larva drops off and subsequent development takes place in the ground. It does not seek another host feeding, but in 1 to 3 weeks a gradual metamorphosis takes place and an octopod nymph emerges. It is neither parasitic nor predacious, apparently feeding upon plant juices. When the nymph has grown to a certain length, it seeks shelter in the earth, and pupation takes place. The emerging imago is free-living in the upper layers of the soil. In Japan the winter is passed mostly in the adult stage. In late May of the following year mature forms deposit their eggs in the soil. In June, when the mean daily temperature reaches about 20° C., the larvae begin to emerge, reach maximum numbers in mid-summer, and largely disappear in October. Thus, in Japan the distribution of the larvae of *T. akamushi* corresponds seasonably with the occurrence of tsutsugamushi disease. In more tropical climates where conditions of temperature and moisture are more uniform, larvae may be active throughout the year.

Although the Japanese investigators did not succeed in carrying mites through a complete cycle of development under laboratory conditions, they were able to prove that the causative agent of tsutsugamushi disease could be recovered from free-living nymphs and adults as well as from larvae reared in the laboratory. Since the mite feeds on an animal host only once in its life cycle, it follows that the rickettsial infection which it acquires in its meal of serum must pass through the complete

cycle of development from the larval form of one stage to the larval form of the next generation before it can be passed on to another animal or to man.

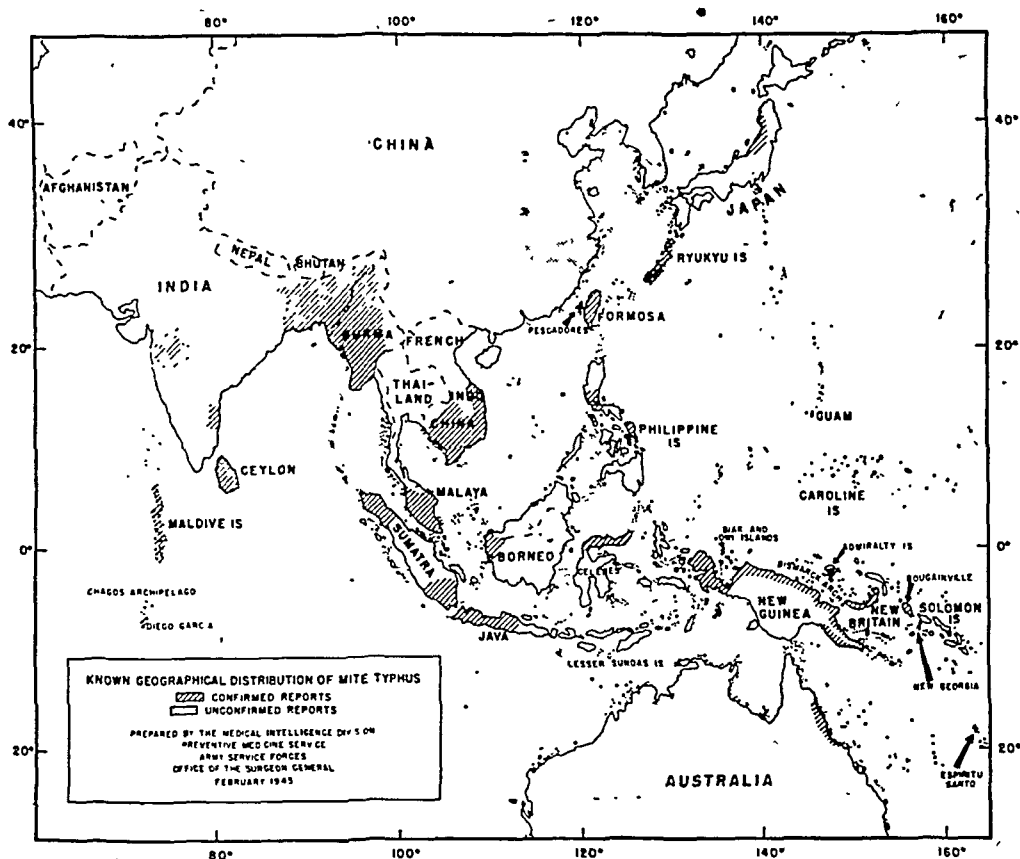
From the reports in medical literature and from the military reports since the beginning of the war with Japan, data have been assembled by the Medical Intelligence Division of the Preventive Medicine Service of the Office of the Surgeon General, U. S. Army, which are the basis for the accompanying map, indicating the geographic distribution of tsutsugamushi disease and related typhus-like fevers.

#### CLINICAL OBSERVATIONS

The Dobadura area in which the studies of the Commission were conducted is roughly triangular in shape on the northeast coast of New Guinea, outlined by lines connecting Oro Bay and Buna with a native village called Inonda, about twenty miles inland on the Samboga River. At the time of these observations it was being used as a supply and staging area. Exposed to risk of infection with "scrub typhus" were the combat troops, the supply organizations, and the air force moving into or through this locality. Through the courtesy of the base surgeon and of the respective commanding officers, the Commission was supplied with reports of all of the patients on whom the final diagnosis of "scrub typhus" was made in the four hospitals serving these forces between August 1 and December 1, 1943.

The Commission made an intensive clinical and laboratory study of a series of cases admitted to Station Hospital No. 363. For present purposes these observations may be briefly summarized. The course of the disease as observed in New Guinea corresponded in all essential particulars to that described for tsutsugamushi disease by the Japanese.

The characteristic early symptoms



and physical signs at onset and during the first 5 to 7 days of the disease were headache, apathy and general malaise, fever, relative bradycardia, anorexia, conjunctival congestions, lymphadenitis, often regional, and an eschar. Although the nature of the illness was frequently suspected from the general symptoms and physical signs, together with a normal or low leukocyte count, it was often possible to establish the diagnosis upon admission to the hospital by the presence of a typical eschar.

Commonly between the 5th and 8th days a characteristic macular or maculopapular rash appeared on the trunk and spread to the extremities. Although the development of a rash tended to confirm the suspected diagnosis, rashes sufficiently similar to that of mite typhus to cause confusion may at times occur in dengue and other infections.

The subsequent course of tsutsugamushi disease after the 1st week was relatively mild, with no recognizable evidence of the more serious aspects of the disease, and a total febrile period of 12 to 14 days; or moderately severe with signs of pneumonitis and encephalitis and recovery by lysis early in the 3rd week; or severe to extremely severe with febrile course of approximately 3 weeks' duration. In these severe cases evidence of peripheral circulatory collapse was common and signs of myocarditis sometimes appeared. Hepatitis and nephritis are reported as complications. Thromboses and cerebral or gastrointestinal hemorrhage may take place.

Laboratory studies confirmed the already known fact that the Weil-Felix test became positive for *Proteus* OXK about the 12th to 14th day of the disease in the majority of cases but that

not all patients develop agglutinins for this organism in a diagnostic titer of 1 in 160 or higher.

Rational treatment seemed to require primarily complete bed rest, good nursing care, adequate diet, fluid and salt intake, and the judicious and selective use of symptomatic drug, supportive and oxygen therapy only when specifically indicated. Penicillin was ineffective.

No special study of the pathology was made by the Commission since this aspect of the disease had already been fully and accurately described by others.<sup>6, 8, 3</sup> In two fatal cases which occurred in the series observed at Station Hospital 363, characteristic histopathology was found. The process was basically a disseminated focal vasculitis, and perivasculitis with conspicuous involvement of the vessels of the skin, lungs, heart, and brain.

During the period of the Commission's study in the Dobadura area there were only 6 deaths in 248 cases, a fatality rate of about 2.5 per cent. The Australian Army estimated its overall case fatality rate from this cause to be about 6 per cent. In small outbreaks the proportionate number of deaths was frequently higher. Although the disease on the whole appeared to be somewhat milder than that described by the Japanese, it must be borne in mind that the group exposed to risk in New Guinea at this time were selected healthy young men, promptly hospitalized and given good medical care.

#### ETIOLOGY

One of the principal objectives of the Commission's studies was to determine whether the etiologic agent of so-called "scrub typhus" in New Guinea was identical with *R. orientalis*, the cause of tsutsugamushi disease. Nine rickettsial strains were recovered by inoculation of Swiss mice with blood obtained from patients early in the course of the disease. These 9 strains of human origin

were carried through at least 9 serial passages in mice, by the intraperitoneal route (with the exception of one which was carried through only 5 passages). Throughout these passages the incubation period, symptoms, post-mortem findings, and microscopical demonstration of rickettsiae were similar for each strain and corresponded to the descriptions of Dinger<sup>18</sup> and Wolff and Kouwenaar<sup>19</sup> for strains of "scrub typhus" or "mite fever" isolated in the Dutch East Indies. The inoculation of mice resulted in typical infections with ascites and death. Rickettsiae were demonstrated which, in morphology, distribution, and staining characteristics, were apparently identical with *R. orientalis* Nagayo, et al.<sup>20</sup> Moreover, the experimental infection of rabbits by the intraocular route with material from 6 of these strains produced an ocular inflammation which has been shown to be specific for *R. orientalis* by the work of Nagayo, et al.<sup>20, 21</sup> and Lewthwaite and Savor.<sup>22, 23</sup> The Syrian hamster was shown to be susceptible to the intraperitoneal inoculation with these rickettsial strains of human origin, and five strains were successfully cultured in the yolk-sac membrane of the developing chick embryo. So far as could be ascertained by these methods, therefore, the species of rickettsia causing "scrub typhus" in New Guinea was identical with the causative agent of tsutsugamushi disease in Japan.

#### EPIDEMIOLOGY

The epidemiological features of "scrub typhus" in the military forces operating in Papua, New Guinea, were analogous to those described for tsutsugamushi disease in Japan, the Federated Malay States, Sumatra, North Queensland, and other endemic areas. An analysis of the occurrence of cases among American forces in the Dobadura area on the northeast coast of New Guinea indicated that, while the disease was contracted in widely scattered

localities, some were more dangerous than others. It also indicated that the exposure to infection was associated with activities which brought men into intimate contact with field conditions such as those which prevail in bivouacs or in establishing camps. During the period of the study the environments in which human infections were known to have originated were kunai grass fields, in which natural conditions were undisturbed at the time of occupation. From the time-distribution of onsets of cases of the disease it was clear that maximum risk was experienced during the first week or two following arrival of a unit in a new area. This risk decreased progressively so that after the 4th or 5th week the incidence became sporadic or ceased entirely, and the site could be occupied with impunity thereafter.

Decline in the attack rate could not be explained as due to the accumulation of immune individuals. It therefore was probable that it was due to decreased exposure to bites of some species of larval mites that served as vectors. Decrease in exposure was correlated with progressive changes produced by development and use of the camp site. Evidently the conditions thus created were unfavorable to continued activity and survival of the vector species.

In attempting to identify this vector species, collections of larval mites were made not only in localities where cases had originated and extensive environmental changes taken place, but also in localities where the environment appeared to be similar but where the natural conditions remained undisturbed.

Two methods were used, boot-collections of unfed larvae and collections of larvae found attached to the small mammals captured in the area. It was to be expected that the vector species would be found among those species received both in boot-collections and from

animals which might serve as a reservoir host of the infective agent. In view of previous work, attention was directed particularly to collections from bandicoots and rats. These animals were present in large numbers and widely distributed throughout the area.

Sixteen species of mites were represented in the collections. Of these 3 were known to attack man and produce "scrub itch." These were *Trombidium buloloensis*, *Schöngastia blestowei* and *Schöngastia pusilla*.<sup>\*</sup> Although they were abundant and widely distributed, it seemed quite unlikely that they served as vectors. They continued to be present in considerable numbers in infected localities after the incidence of cases had become sporadic or ceased altogether. There was no correlation between the incidence of "scrub itch" and that of tsutsugamushi disease. Patients gave no history of itching at the site of the specific primary lesion or eschar. The primary lesions or eschars were found on various parts of the body, while the lesions of "scrub itch" were characteristically distributed on the ankles, legs, and, to a lesser extent, on the lower trunk. Finally, it is significant that two of these species were found only in small numbers and infrequently on bandicoots and rats, and the third (*S. pusilla*) was not encountered on these hosts at all.

Of the remaining 13 species, 10 can be dismissed because they were either rare or absent in boot-collections, or were not found on rats or bandicoots. The remaining 3 deserve special consideration, namely, *T. deliensis*, *T.*

<sup>\*</sup> Specimens were identified quite largely on the basis of the papers "The trombiculinae (acarina) or itch-mites of the Austro-Malayan and Oriental Regions" by Womersley and Heaslip<sup>24</sup> (1943), and "Notes on and additions to the trombiculinae and Leeuwenhoekinae (acarina) of Australia and New Guinea" by Womersley<sup>25</sup> (1944). In these two papers 33 species are recorded for New Guinea, a few of which may be regarded as of tentative rather than of established validity and are still under consideration by Womersley and others. This applies to the species *Trombicula walchi* and *Trombicula fletcheri*, to which reference will be made later.

*walchi* and *T. fletcheri*. The first two species are very closely related and all are allied to *T. akamushi*, known to be the vector of tsutsugamushi disease in Japan. *T. deliensis* is mentioned first only because it has been thought to be the vector in Sumatra, Federated Malay States, India, and Australia. This species was found only in one restricted locality which happened to be a focus in which there was a high incidence of the disease. It was not taken in boot-collections and was found only on 3 of 55 rats examined in the Dobadura area. Because of its apparently restricted distribution, it seems quite unlikely that *T. deliensis* was an important vector in this part of New Guinea.

While *T. walchi* occurred sparingly, *T. fletcheri* far exceeded in frequency and numbers all other species on rats and bandicoots. That troops were exposed to attack by both species was indicated by the boot-collection of unfed larvae in the type of environment associated with the risk of infection and in certain known infected localities. In one infected locality where mites were scarce these were the most numerous species and no scrub itch mites were found. The scarcity of *T. walchi* and *T. fletcheri* in boot-collections as compared with "scrub-itch" mites suggested that man is attacked infrequently by these two species. Nevertheless, the observations made are consistent with the hypothesis that either *T. fletcheri* or *T. walchi* or both may serve as vectors in this area. Furthermore, by mouse inoculation *Rickettsia orientalis* was recovered from two pools of mites (*T. fletcheri*) collected from two bandicoots. Brain tissue from these same animals, injected into white mice, failed to produce a rickettsial infection. In view of this negative result and the fact that generation-to-generation transfer of *R. orientalis* occurs in mites, the evidence does not incriminate the bandicoot as a reservoir host. The mites may have

been infected in a previous generation on another host species.

Other arthropod ectoparasites, in addition to trombiculid mites, were considered but there was no evidence to suggest that they were involved in the transmission of the disease in this area. Although ticks were found on bandicoots and occasionally on rats, there were no reports of the species here represented having been found on man.

Investigation to establish further the identity of the vector species of mites and the animal reservoir in the Dobadura area were continued by Kohls, Armbrust, Irons, and Philip, and are the subject of a subsequent report.<sup>2</sup>

#### PREVENTION

The vaccine made from suspensions of *R. prowazeki* used in the prevention of epidemic (louse-borne) typhus confers no immunity against scrub typhus (tsutsugamushi disease). Studies are in progress exploring the possibility of developing an effective method of immunization against *R. orientalis*. Up to the present time these efforts have been unproductive.

Prevention must, therefore, depend upon measures directed toward reducing the risk of exposure to mites. In staging and supply areas it is possible to take reasonable precautions. Locations which are to be used as new camp sites can be prepared as fully as possible before the arrival of a new unit, employing native labor whenever it is available. All grass and scrub should be cut level with the ground, and, after drying; collected and burned, or hauled away. It is highly desirable to burn over the camp area with a power oil sprayer or flame thrower. Underbrush in adjacent jungle strips should be cleared out in a similar manner. Sleeping on the ground should be avoided; so far as practicable cots should be used. Where facilities are available, troops should be instructed to

bathe with thorough soaping and scrubbing of the skin with a rough cloth.

Protection under field and combat conditions is a more difficult matter. Dependence must be placed upon impregnation of uniforms and socks with effective anti-mite fluids such as dimethyl or dibutyl phthalate. The impregnation may be done by hand application. A better distribution and more permanent effect is obtained by immersing the clothing in a mixture of the repellent and soap after washing. Impregnated in this manner, the protective value is slowly lost in the course of a week or two provided the antimite fluid is not washed out by rain or wading through streams. Trouser legs should be tucked inside the socks and high boots worn.

#### SUMMARY

The studies of the Commission confirmed the hypothesis that the "endemic" or "scrub" typhus in New Guinea is indistinguishable from the tsutsugamushi disease of the Japanese islands, southeastern Asia, and the adjacent island archipelagoes. Its clinical course has been fully described by many observers. Serologically, it is distinguished by a Weil-Felix reaction which is positive with *Proteus* OXK. Pathologically, it is characterized by a disseminated focal vasculitis and perivasculitis which involves particularly the vessels of the skin, lungs, heart, and brain. There is no specific therapy. Treatment is symptomatic and supportive. The case fatality rate was relatively low in the healthy young soldiers who were attacked in this area. The etiologic agent was identified as *R. orientalis*. Epidemiological evidence regarding the conditions under which infection took place was consistent with transmission through the bite of a mite. It was demonstrated that *T. fletcheri* Womersley and Heaslip 1943 could be

an effective vector in this locality, and *R. orientalis* was actually recovered from two pools of mites, which consisted almost exclusively of *T. fletcheri* collected from bandicoots. This species of mite in the larval stage is parasitic upon wild rats and bandicoots, which are numerous in the endemic areas. Investigations to establish the animal reservoir are being continued. Prevention of the disease depends upon reducing exposure to mite bites and measures directed toward this end have been instituted.

#### REFERENCES

1. Blake, Francis G., Maxcy, Kenneth F., Sadusk, Joseph F., Jr., Kohls, Glen M., and Bell, E. John. Studies on Tsutsugamushi Disease (scrub typhus, mite-borne typhus) in New Guinea and Adjacent Islands: Epidemiology, Clinical Observations, and Etiology in the Dobadura Area. *Am. J. Hyg.*, 41: 243 (May), 1945.
2. Kohls, Glen M., Armbrust, Charles A., Irons, Edwin N., and Philip, Cornelius B. Studies on Tsutsugamushi Disease (scrub typhus, mite-borne typhus) in New Guinea and Adjacent Islands: Further Observations on Epidemiology and Etiology. *Am. J. Hyg.*, 41:374 (May), 1945.
3. Williams, S. W., Sinclair, A. J. M., and Jackson, A. V. Mite-borne (scrub) Typhus in Papua and the Mandated Territory of New Guinea: Report of 626 Cases. *M. J. Australia*, 2:525, 1944.
4. Cook, C. E. Observations on the Epidemiology of Scrub Typhus. *M. J. Australia*, 2:539, 1944.
5. McCulloch, R. N. Notes on the Habits and Distribution of Trombiculid Mites in Queensland and New Guinea. *M. J. Australia*, 2:543, 1944.
6. Corbett, A. J. Scrub Typhus. *Bull. U. S. Army Med. Dept.*, 70:34, 1943.
7. Ahlm, C. E., and Lipshutz, J. Tsutsugamushi Fever in the Southwest Pacific Theater. *J.A.M.A.*, 124:1095, 1944.
8. Lipman, B. L., Casey, A. V., Byron, R. A., and Evans, E. C. Scrub Typhus: Results of a Study of the Cases of Two Hundred Patients Admitted to and Treated at a Station Hospital between Feb. 9, 1943, and Feb. 4, 1944. *War Med.*, 6:304, 1944.
9. Berry, M. G., Johnson, A. S., Jr., and Warshauer, S. E. Tsutsugamushi Fever. Clinical Observation in One Hundred and Ninety-five Cases. *War Med.*, 7:71, 1945.
10. Levine, H. Cardiac Changes of Tsutsugamushi Fever (scrub typhus): An Investigation into Their Persistency. *War Med.*, 7:76, 1945.
11. Farner, D. S., and Katsampes, C. P. Tsutsugamushi Disease.. *U. S. Nav. M. Bull.*, 43:798, 1944.
12. Fletcher, W., Lesslar, J. P., and Lewthwaite, R. The Aetiology of the Tsutsugamushi Disease and Tropical Typhus in the Federated Malay States. Part II. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 23:57, 1929.
13. Lewthwaite, R., and Savor, S. R. The Relation of Sumatran Mite Fever to the Tsutsugamushi Disease of British Malaya. *Brit. J. Exper. Path.*, 21:117, 1940.
14. Kouwenaar, W., and Wolff, J. W. Rickettsia

in Sumatra. *Proc. Sixth Congress, Pacific Science Assn.*, 1939. 5:633, 1942.

15. Walch, E. W., and Keukenschrijver, N. C. Über die epidemiologie des pseudo-typhus von Deli. *Arch. f. Schiffsu Tropen-Hyg., Path. u. Ther. exot. Krankh.* (Beiheft), 29:420, 1925.

16 Williams, R. W. A Check List of the Mite Vectors and Animal Reservoirs of Tsutsugamushi Disease. *Am. J Trop Med.*, 24:355, 1944.

17 Tanaka, K., Kaiwa, J., Teramura, S., and Kagaya, J. Beiträge zur japanischen Kedanikrankheit. *Zentralbl. f. Bakt., Parasit. u. Infekt.*, 116:353, 1930.

18 Dinger, J. E. Tropical ("scrub") typhus by witte muizen *Geneesk. tijdschr v. Nederl.-Indië*, 73:329, 1933

19 Wolff, J. W., and Kouwenaar, W. Onder zoekingen over de sumatraansche mijtekoorts. *Geneesk tijdschr v. Nederl.-Indië*, 74:1608, 1934

20 Nagayo, M., Miyagawa, Y., Mitamura, T., Tamiya, T., Sato, K., Hazato, H., and Imamura, A. Ueber den nachweis des erregers der tsutsugamushi-

krankheit, der *Rickettsia orientalis*. *Jap. J. Exper. Med.*, 9:87, 1931.

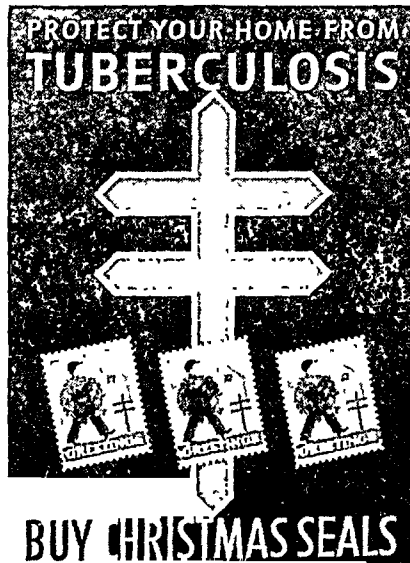
21. Nagayo, M., Tamiya, T., Mitamura, T., and Sato, S. On the Virus of Tsutsugamushi Disease and Its Demonstration by a New Method. *Jap. J. Exper. Med.*, 8:309, 1930.

22. Lewthwaite, R., and Savor, S. R. The Typhus Group of Diseases in Malaya. Part I. The Study of the Virus of Rural Typhus in Laboratory Animals. *Brit J Exper. Path.*, 17:1, 1936.

23. Lewthwaite, R., and Savor, S. R. The Typhus Group of Diseases in Malaya Part II. The Study of the Virus of Tsutsugamushi Disease in Laboratory Animals *Brit J. Exper. Path.*, 17:15, 1937.

24 Womersley, H., and Heaslip, W. G. The Trombiculinae (Acarina) or Itch-mites of the Austro-Malayan and Oriental Regions. *Tr. Roy. Soc. South Australia*, 67:68, 1943

25 Womersley, H. Notes on and Additions to the Trombiculinae and Leewenhoekiinae (Acarina) of Australia and New Guinea. *Tr. Roy. Soc. South Australia*, 68:82, 1944.



# Pulmonary Calcification in Negative Reactors to Tuberculin

AMOS CHRISTIE, M.D., AND J. C. PETERSON, M.D.

*Department of Pediatrics, Vanderbilt University School of Medicine,  
Nashville, Tenn.*

FOR a number of years one of the unsolved clinical problems in tuberculosis control has been the question of calcification in the chests of persons who do not react to tuberculin. It is the purpose of this paper to present data which may resolve some of the discussion which has taken place around this controversy and to add information to the support of the views that the calcium deposits are secondary to some other infection.

## REVIEW OF THE LITERATURE

It is commonly assumed, at least by pediatricians,<sup>1</sup> that only in the very exceptional case will a person who has been previously infected with tuberculosis fail to react to 1 mg. of O.T. These exceptional cases include some far advanced, overwhelming infections, such as miliary tuberculosis or tuberculous meningitis in its terminal stage. Certain other infections, such as measles, seem temporarily to suppress tuberculin allergy. The occasional case of lost sensitivity or anergy is also well recognized as is the recently infected subject who has not developed his sensitivity or is preallergic.

Some doubt as to the validity of this assumption began to appear as early as 1926 and 1929 when studies by Opie<sup>2, 3</sup> and his associates revealed an appreciable number of children who failed to react to 1 mg. of O.T. and who had demonstrable x-ray lesions in their chests interpreted as tuberculosis.

In 1931 Barnard, Amberson and Loew<sup>4</sup> found that, of a group of 184 adolescent children who had demonstrable x-ray lesions which could be interpreted as tuberculous, 6 per cent failed to react to tuberculin.

That an even more unique situation existed in some sections of the southeastern states was first reported by Crabtree, Hickerson, and Hickerson<sup>5</sup> who in 1933 reported the study of a group of Negroes over 4 years of age who were negative to tuberculin. Seventeen per cent of them were found to have calcified lesions in their chests by x-ray examination.

Nelson, Mitchell, and Brown<sup>6</sup> (1937), from Cincinnati, found calcifications by x-ray in 43.5 per cent of 27 children who did not react to 0.005 mg. of P.P.D. or to 1.0 mg. of O.T.

Although Crabtree had found a large number of Tennessee children with calcifications who did not react to tuberculin, Gass<sup>7</sup> and his coworkers in 1938 were first to show conclusively that an unusual and confusing situation existed in Middle Tennessee. They carried out tuberculin sensitivity tests and examined chest roentgenograms on 1,015 white children and 276 colored children. Of the white children, 44.5 per cent were positive to 1.0 mg. of O.T., while 51.8 per cent of the colored children gave a positive reaction. Definite calcified lesions occurred among white children in 48.1 per cent of the negative reactors to tuberculin and in



51.1 per cent of the positive reactors. The same relationship was found for the Negro children.

It was recognized by these workers that this was not in agreement with the generally accepted ideas on tuberculin allergy in relation to tuberculous infections as revealed by roentgenograms and further confirmation of their interpretations was sought. Chest roentgenograms of 154 white children from this study were sent to four independent specialists in the tuberculosis field. They were asked to read the films for presence or absence of evidence indicating tuberculous infection. These observers had no knowledge of the result of the tuberculin tests. There was remarkable agreement among these specialists that in 24.7 per cent of the children who were negative to 1.0 mg. of O.T., there was definite evidence of calcification or what were thought to be tuberculous lesions. Gass and his associates stated, "This would appear to confirm the observation on the part of the clinicians in this area that evidence of tuberculous infection is present in a considerable proportion of children who do not have a positive tuberculin test."

In 1939 Crimm and Short<sup>8</sup> reported that 13.8 per cent of 1,384 persons living in Indiana had negative tuberculin tests but showed evidence of pulmonary calcification.

Also, in 1939 Lumsden, Dearing, and Brown<sup>9</sup> published a startling comparative study of two groups of children. One group was from Coffee County in southeastern Alabama, an area with a low tuberculosis rate, while the other group was from Giles County in south central Tennessee, an area with a high tuberculosis rate. In Giles County 43.2 per cent of the white school children and 25.8 per cent of the colored children, and in Coffee County, only 0.6 per cent of the white children and 1.1 per cent of the colored school children

showed pulmonary calcifications. In other words, the incidence of pulmonary calcification was forty times as high in Tennessee as it was in south Alabama. Even more interesting was the fact that among the white school children in Giles County, calcifications occurred almost as frequently among those reacting negatively to tuberculin (42.7 per cent) as among the positive reactors (46.5 per cent). The same relationship held for the colored children. With the assumption that calcification of pulmonary and hilar lesions meant tuberculosis, the conclusion seemed justified that skin testing as a sole means of establishing an epidemiological index or rate of prevalence of tuberculosis in childhood populations was of questionable value or "definitely futile." In a later summary Lumsden and Dearing<sup>10</sup> exhaustively studied the epidemiology of this situation and concluded that their studies strongly suggest, "that some factor or set of factors of a general environmental nature, such as may derive directly from the soil" operates to explain the regional distribution of "tuberculosis morbidity" in the southeastern United States.

Following these reports, Gass<sup>11</sup> and his associates working in Williamson County, of middle Tennessee, studied 573 children who were tested with tuberculin and x-ray of their chests in 1937 and 1939. Three hundred and seventy-three, or approximately two-thirds of the study group, showed calcifications. These lesions occurred early in life. The majority were present on admission to school. There was no relation to the tuberculin reaction, approximately as many occurring in the negative reactors as in the positive.

Olsen, Wright, and Nolan<sup>12</sup> in 1941 studied this problem in Ross County, Ohio. Of 485 white children, 129, or 26.6 per cent, had demonstrable pulmonary calcifications. Tuberculin tests and x-ray examinations were completed

on 148 children under 20 years of age. Sixty-two of this group had calcified pulmonary lesions. Six of them, or 9.7 per cent, were tuberculin-positive and 56, or 90.3 per cent, were tuberculin-negative.

In 1943, Gass<sup>13</sup> and his associates reported the restudy of 1,167 school children from Williamson County, Tennessee, by serial roentgenograms and tuberculin testing. The serial x-ray studies over the 4 year period showed that 83 per cent of the white children and 72 per cent of the colored children studied had pulmonary calcifications. The study showed that children acquired calcifications at a very early age, and that the percentage of lesions did not increase appreciably in the older age groups. It was present almost as frequently in children 7 to 9 years of age as in older children. Many of the children who acquired calcifications during the study failed to react to tuberculin at any time.

In a recent paper Long and Stearns,<sup>14</sup> using Selective Service induction x-rays, showed that the geographical pattern of calcification suggested above was maintained. "High incidence (over 15 per cent) was noted in a region bounded roughly by Fort Oglethorp, Georgia; Jefferson Barracks, Missouri; Little Rock, Arkansas; and Columbus, Ohio." The calcifications in general from men in this area were not only more frequent but larger and more extensive than in the chests of men from other parts of the country. More cases of "disseminated miliary calcifications" were noted in this area. The range of calcification in the chests of inductees varied from 6 per cent in Washington to 23 per cent in Missouri, and 28 per cent in Kentucky.

In 1945, Dillon, Gass<sup>15</sup> and associates, reporting results of a high school tuberculosis program in Tennessee, found 5,848 white students who reacted to tuberculin and who received x-ray

examination of their chests. Forty per cent of these young people were found to have calcified lesions in their lungs. In 34 counties the rate of pulmonary calcification was less than 35 per cent, but in 25 counties it was found to be 55 per cent or higher. Twenty of these counties were located in middle Tennessee, an area which includes Williamson County.

#### SUMMARY OF REVIEW OF LITERATURE AND COMMENTS

These studies reveal with monotonous regularity the fact that there is in certain sections of the United States a prevalence of pulmonary calcification far beyond what can be explained on the basis of tuberculosis as revealed by tuberculin testing. Except for the early reports by Opie<sup>2, 3</sup> and Barnard,<sup>4</sup> which showed a lesser prevalence of the phenomena, all reports emphasizing this discrepancy between tuberculin sensitivity and roentgenologic information generally interpreted as indicative of tuberculosis have been from studies of young people living on or adjacent to the western Appalachian plateau, or in the eastern slope of the Mississippi River basin and the bordering states of the western slope of the Mississippi River.

The prevalence of this unexplained pulmonary calcification varies from state to state within the area and even within the states, some striking differences occurring in counties within a state. The reasons for these differences remain entirely unexplained.

The accepted interpretation that pulmonary calcification is usually or generally evidence of primary or first infection type tuberculosis would need to be completely reëvaluated if it should be found that this unexplained calcification is caused by some other infection. The implications of such a finding from clinical, epidemiological, control and public health viewpoints are tremendous.

The view that tuberculin sensitivity is a stable phenomenon, as is generally accepted by most pediatricians and immunologists, and the view that pulmonary calcification is usually an indication of a pulmonary tuberculosis infection are not compatible. One of these views must be in error.

The fact that Gass<sup>13</sup> and his associates have been able to observe the development of calcified lesions in a number of children who did not during the period of observation show tuberculin sensitivity is strong evidence that this calcification unassociated with tuberculin sensitivity is at least in part due to some cause other than tuberculosis.

It is our purpose in reporting the following study to attempt to aid in the clarification of this interesting and controversial problem.

#### GENERAL AND RELATED OBSERVATIONS

In the fall of 1943 one of us took up residence in this area of frequent pulmonary calcification in tuberculin-negative reactors. He began to see many children whose chests revealed this unexplained calcification phenomenon. Having had considerable clinical experience with coccidioidomycosis of the western arid regions, it was natural for one with such experience to desire to rule out coccidioidomycosis in children who had calcifications and who were negative to tuberculin. That coccidioidomycosis produces a primary complex which goes on to calcification indistinguishable from that of tuberculosis has been shown by Cox and Smith,<sup>16</sup> by Aronson, Saylor, and Parr<sup>17</sup> and is generally recognized in areas of the West where coccidioidomycosis is endemic. When we obtained coccidioidin for the skin tests from Dr. Charles E. Smith,<sup>10a</sup> of Stanford University, he made the following observation:

As men from all over the United

States arrived at the air fields of the San Joaquin Valley of California they were given coccidioidin tests. Many slightly positive or equivocal reactors were noted, especially in men from Missouri, Illinois, Kentucky, Tennessee, Virginia, Ohio, Indiana, and Pennsylvania. None of them gave the really vigorous reactions so frequently seen with patients from the San Joaquin Valley with coccidioidomycosis. This situation was further complicated by Emmons's discovery<sup>18</sup> of *Haplosporangium parvum* and the apparent cross-sensitivity between coccidioidin and antigens derived from *Haplosporangium parvum*. Animals infected with *Haplosporangium parvum* gave a slight reaction to coccidioidin and stronger to haplosporangin; animals infected by coccidioides gave a slight reaction to haplosporangin and much stronger to coccidioidin. Men infected by coccidioides in the San Joaquin Valley, according to Smith, react slightly to haplosporangin compared to that of coccidioidin. However, the men from Tennessee and Missouri when tested at the air fields in California reacted more strongly to haplosporangin than to coccidioidin. This again suggested cross-sensitivity with fungous antigens. Smith,<sup>10</sup> in May, 1943, and by personal communications<sup>10a</sup> in December, 1943, suggested that "there is a definite sharing of a common skin reactive antigen between haplosporangin and coccidioidin, and it seems very likely to me that infection (probably fungous) causes a similar situation in Tennessee regions," i.e., pulmonary calcifications. He stated, "This is the area of pulmonary calcifications in tuberculin negative persons and is also the endemic area of histoplasmosis."

Nelson,<sup>20</sup> who tested the children in an orphanage in Xenia, Ohio, had previously reported a high proportion of positive reactors to coccidioidin. However, the results of our own skin testing

of 125 children with coccidioidin<sup>21</sup> showed no significant reactions. There is no evidence clinically or pathologically that coccidioidomycosis is present in the Tennessee area. Furthermore, *Coccidioides immitis* is a fungus of dry, arid regions, terrain strikingly unlike the regions of the Appalachian plateau.

Having satisfied ourselves that coccidioidomycosis did not account for the benign calcifications seen so frequently here, it became immediately apparent that *Histoplasma capsulatum* should be investigated as a possible etiological agent.

It is not within the scope of this report to review the biological and morphological characteristics of *Histoplasma capsulatum* or the pathological and clinical features of histoplasmosis. This has been adequately done in the reviews of Meleney,<sup>22</sup> of Beamer, Smith, and Barnett,<sup>23</sup> of Hild,<sup>24</sup> and the recent excellent report of Parsons and Zarafonitis.<sup>25</sup> This infectious disease occurs in all age groups and from all reports is uniformly fatal. It can be of acute or chronic nature. No benign forms have been described. While it is of world-wide distribution, more than half of the reported cases have occurred in states which correspond to the area of benign calcification in non-tuberculin reactors discussed above. It is due to a fungus which occurs in tissues in the yeast forms and ordinarily grows on culture media in the mycelial form. Demonstration of the fungus etiology of the disease was first obtained by the epochal cultural and transmission experiments of Demonbreun<sup>26</sup> in this clinic. The organism produces lesions which simulate many common diseases. It produces ulceration of the mucosa and miliary lesions with caseous necrosis and granulomata which closely resemble tuberculosis. This variety of clinical manifestations makes it seem quite possible that benign forms may exist and

that the clinical picture might be one such as described in coccidioidomycosis with its primary complex going on to calcification much as in tuberculosis.

In January, 1944, a 5 month old infant was brought to Vanderbilt Hospital from a rural area of Tennessee. One month before admission he developed a transient irritability, increasing pallor, and loss of weight. Fever was present and he developed a "chest cold" 8 days before admission. He developed jaundice and bled from the bowel. Physical examination revealed an acutely ill infant who was extremely pale and had hepatosplenomegaly. Examination of his peripheral blood revealed 5 gm. of hemoglobin, 1.68 million R.B.C., 56,800 W.B.C., with an essentially normal differential. An admission diagnosis of acute leukemia was made. Further examination of the blood smear, however, revealed the presence of many large mononuclear leucocytes containing groups of 2 to 20 yeast-like bodies with refractile cell borders. Similar bodies were found in the bone marrow and the diagnosis of histoplasmosis was later confirmed by cultivation of the organism from the patient's blood and bone marrow. Following the suggestions of Zarafonitis and Lindberg,<sup>27</sup> and those of Van Pernis, Benson, and Holinger,<sup>28</sup> an antigen was prepared from a filtrate of an old broth culture of *Histoplasma capsulatum*. This culture was from a prior case, classical in all respects.\* An intradermal injection of 0.1 ml. of a 1:100 dilution of this antigen yielded a local reaction of several centimeters of edema and erythema. A coccidioidin test was negative, as was the tuberculin test. Similar histoplasmin † skin tests

\* We are indebted to Dr. James Owens, of the Department of Pathology, for the first material we used in skin testing. He prepared the antigen for us from a culture which he was studying.

† Histoplasmin is the term we used to designate the antigen we were using for skin testing. It is to be hoped that this natural term will be used for any antigen which may be found satisfactory for the purpose of skin testing in relation to histoplasmosis.

on the mother and father were both positive. The infant died and no autopsy was obtained, but two blood cultures revealed a positive culture of *Histoplasma capsulatum* in heavy growth. One blood culture contained as many as 3,000 colonies per ml. This unpublished case is interesting because it was diagnosed ante-mortem and because it was our first experience that a human case of histoplasmosis would develop sensitivity to a skin test material made from the organism.

Following this and using the same antigen, we applied for a short period skin tests of this broth culture filtrate to all children admitted to this service, as well as to many of the house staff. The coccidioidin tests noted above were also applied at this time. After approximately 125 children had been tested with both antigens, an analysis revealed that, while only a few of the children reacted slightly or equivocally to coccidioidin, about 23 per cent of the children reacted to histoplasmin. The great majority of the 125 children tested were infants, which may account for the small number reacting to the antigen. This point will become more pertinent later. However, there were several infants under 1 year of age who had positive reactions, although no previous history of significant illness could be obtained. These routine skin tests have been continued and the results will be reported later.

As a result of our preliminary skin tests with histoplasmin it seemed apparent: (1) that either the response to the skin test was the result of previous infection with *Histoplasma capsulatum* or to infection with some other fungus having a common or closely related antigen; (2) that infection with this unknown fungus was much more common than could be explained on the basis of any clinically known fungous infection, including the fungi commonly responsible for dermatomycoses; (3)

that infection with such an agent must at times be almost symptomless. The positive test in the 5 month old child with histoplasmosis was at least suggestive of some specificity. It follows, of course, that histoplasmosis might exist in benign form, and that all the people who had positive tests might have had an unrecognized infection.

Many of those routinely tested who reacted positively to histoplasmin were cases with pulmonary calcification and negative tuberculin reactions. This immediately suggested that histoplasmosis might be the etiologic cause of the unexplained benign pulmonary calcification common to this region.

Members of the pediatric staff and medical student body who have lived all their lives in Kentucky, Tennessee, and Missouri reacted strongly to the antigen, while conversely other members who had recently arrived from California, Maryland, and New York did not react. One medical student, whose home was in Missouri, had a presumably negative chest plate on induction into the Army. He was found in our preliminary studies to be negative to 1 mg. of tuberculin but extremely sensitive to histoplasmin. Two years after induction into the Army, he has been discharged because he has diffuse disseminated calcification in his chest. Although he has been continuously negative to tuberculin, he must have laid down sufficient calcium in his chest in the 2 year period to make him fall outside of standards set up by the Army. He is entirely well and leads a strenuous outdoor life besides his medical school studies.

In 1941 a well developed and nourished 10 month old male infant was admitted to Vanderbilt University Hospital. He was the only child of young healthy parents who lived in a nearby rural area. His admission was for convulsions which were subsequently proved to be due to bilateral subdural

hematomata chronic enough to have caused a hydrocephalus; head circumference 47 cm. He died from hyperpyrexia and convulsions following surgical removal of the abnormal membranes on one side, death occurring less than 12 hours after operation. Lesions compatible with subdural hematomata or hygroma were found at autopsy. There was also in each lower lobe of the lungs a small 3 to 4 mm. greyish nodule which cut with gritty resistance and which had white areas of calcification. The tracheobronchial nodes were dark red and soft, free of areas of caseation or calcification. Microscopic sections of the pulmonary nodules showed them to be composed of several giant cells with many nuclei lying among large mononuclear cells. This lesion was surrounded by small round cells and a few epithelioid cells. Stained sections failed to show tubercle bacilli. The hilar nodes showed hyperplasia. The germinal centers contained large pale cells apparently necrotic, but there were no granulomatous lesions. The liver and spleen appeared normal to gross examination, but sections showed small granulomatous lesions like those in the lung. In the liver sections there were several small lesions consisting of several large mononuclear or giant cells surrounded by small round cells. In the spleen sections there was a lesion composed of giant cells in a matrix of greyish pink amorphous material containing a few round cells surrounded by a layer of fibrous tissues. Dr. R. D. Lillie of the National Institute of Health studied tissues from this child and their laboratory was able to grow *Histoplasma capsulatum* from the hilar lymph nodes. The fact that the spinal fluid was normal and that the cultures of the subdural fluid showed no growth after 11 days of incubation would seem to exclude *H. capsulatum* as having been the cause of the cerebral lesion and of the child's death. It is

possible, therefore, that this child represents a benign case of histoplasmosis.

Palmer<sup>29</sup> recently reported the results of skin testing 3,105 nurses in five widely distributed centers with histoplasmin,\* and tuberculin. Chest roentgenograms had been made. Of the total group of 3,105 nurses tested, 294 were noted to have pulmonary calcifications. Of this group, 21.4 per cent with calcifications reacted to tuberculin, while among the remainder who had negative tuberculin tests the great majority had positive histoplasmin skin tests. Only 25, or 8.5 per cent, of the nurses with calcifications had a negative reaction to both tuberculin and histoplasmin. He found histoplasmin tests positive in 4.7 per cent of the nurses from Minneapolis, in 61.5 per cent of the Kansas City, Mo., group, and 50.2 per cent in the Kansas City, Kan., group. These areas correspond to areas of low and high prevalence of pulmonary calcification in those negative to tuberculin. Summarizing his results in a different manner, among nurses reacting only to tuberculin, 10.4 per cent show calcifications, while among those reacting only to histoplasmin 31.1 per cent show calcifications. Among those reacting to both antigens, 34.1 per cent show calcifications. Only 1.2 per cent of the group as a whole had calcifications without reacting to one or the other of the antigens. He concluded, based on this evidence, that a mild, probably subclinical form of histoplasmosis (or infection with an immunologically related organism) is responsible for a high proportion of calcifications seen in x-rays of tuberculin-negative reactors.

These studies and our own preliminary observations would seem to indicate a strong possibility that infection with *Histoplasma capsulatum* is related to the problem of non-tuberculous be-

---

\* Palmer's antigen was a filtrate of a broth culture similar to the material we used.

nign pulmonary calcification. Further studies of this and associated problems seem to be indicated.

Of the problem related to the study of the question of histoplasmosis, the finding of a satisfactory antigen for skin testing seemed of primary importance. Our preliminary antigen represented the broth soluble elements from organisms growing in the mycelial form. While we have been able to get readable skin responses to this material, it is not an entirely satisfactory antigen. To get good responses it is necessary to use 0.001 ml. to 0.01 ml. of the original broth culture and, as the organism is relatively fastidious, this has been a meat infusion broth with its numerous extraneous antigens. These collateral antigens may, particularly in adults, detract from the specificity of the skin test. Inasmuch as the fungus seems to grow only in the yeast form in infected animals and man, it would seem that an antigen derived from the yeast phase would not only be more representative of the antigens in contact with tissues but would have the added advantage that it could be harvested almost entirely free of extraneous antigens.

Preliminary studies,<sup>30</sup> to be reported elsewhere, have shown that the yeast form yields a very satisfactory antigen and that the soluble surface antigen, or antigens, are as effective from the viewpoint of skin tests as are solutions of the entire disrupted organism.

Other preliminary observations on guinea pigs which received sub-lethal but infective doses of live *Histoplasma capsulatum* yeast cells show that these animals do develop skin reactions qualitatively similar to those observed in man.

While this problem is being studied, we have continued testing groups of children with the diluted filtrate of broth cultures of the mycelial form of *Histoplasma capsulatum*.

#### STUDY OF RESPONSES OF CHILDREN

For the first group to be studied the children from a children's home were selected because of the stability of the population, the fact that the children had lived all their lives in the State of Tennessee, and because we knew that there were among the group many who had pulmonary calcification but did not react to tuberculin. The children's home is located in Williamson County, Tennessee. The age distribution of the group is shown in Table 2. The sex distribution is approximately equal.

X-rays of the chests were made with portable equipment on 4 x 5 inch stereoscopic film and read for presence or absence of calcification by Dr. E. F. Harrison, of the Division of Tuberculosis Control, Tennessee Department of Public Health, whose experience with this technique has been extensive. Old tuberculin 0.1 mg. and a preparation of histoplasmin (0.1 ml.)\* were applied intradermally. These were read in 72 hours. This time was selected because of our previous knowledge that skin test sensitivity to histoplasmin comes up sharply at 40 to 60 hours and remains present for 2 to 3 weeks. Edema surrounded by a large area of erythema is present in positive reactions. This is followed by slight desquamation as the reaction to histoplasmin subsides. Measurements were taken of both edema and induration, as well as the erythema surrounding the site of inoculation. Reactions called positive were those having a diameter of induration over 5 mm. Negative reactions had no induration or erythema. No difficulties were encountered in reading the tests. They were, with only one or two exceptions, either definitely positive or negative to anyone familiar with reading tuberculin tests.

---

\* Histoplasmin 1:100 dilution, 0.1 ml.  $\approx$  to 0.001 ml. of original filtrate.

## RESULTS

One hundred and eighty-one children were examined. Forty-five, or 24.9 per cent, reacted to tuberculin, 133, or 73.5 per cent, reacted to histoplasmin, and

The appearance by age groups of tuberculin reactivity, histoplasmin reactivity, and the appearance of pulmonary calcifications is summarized in Chart 1.

TABLE 1

*Results of Histoplasmin and Tuberculin Tests and the Presence of Pulmonary Calcification in Tennessee Children*

No. Examined	Tuberculin Positive		Histoplasmin Positive		Calcifications	
	No.	Per cent	No.	Per cent	No.	Per cent
181	45	24.9	133	73.5	79	43.6

79, or 43.6 per cent, had pulmonary lesions interpreted as calcifications. It is obvious from a study of these figures that almost twice as many children (43.6 per cent) had calcification as were tuberculin-positive (24.9 per cent). This is consistent with other studies reviewed above. Positive reactions to histoplasmin, 73.5 per cent, were three times as common as positive reactions to tuberculin. These findings are shown in Table 1.

The reactions to histoplasmin were encountered in the youngest age group to the extent that 41.7 per cent of those under 5 years gave positive reactions. The per cent positive increased with each age increase to a maximum of 92.6 per cent in the children 15 to 19 years of age. These findings are shown in Table 2.

None of the children under 5 years of age reacted positively to 0.1 mg. of tuberculin. The per cent positive increased thereafter with each age group to a maximum of 51.9 per cent. These observations are shown in Table 3.

The rate of appearance of calcium by age groups was intermediate between the rate observed for histoplasmin reactions and tuberculin reactions. There was a lag behind the histoplasmin reactions but the appearance rate was definitely more rapid than that of tuberculin sensitivity. These findings are shown in Table 4.

TABLE 2

*Number and Percentage of Children Positive to Histoplasmin by Age Groups*

Age	Number	Positive	
		Number	Per cent
Total	181	133	73.5
Under 5	12	5	41.7
5-9	55	35	63.6
10-14	87	68	78.2
15-19	27	25	92.6

TABLE 3

*Number and Percentage of Children Positive to Tuberculin by Age Groups*

Age	Number	Positive	
		Number	Per cent
Total	181	45	24.9
Under 5	12	..	...
5-9	55	8	14.5
10-14	87	23	26.4
15-19	27	14	51.9

TABLE 4

*Number and Per cent of Children Showing Pulmonary Calcifications by Age Groups*

Age	Number in Group	Showing Calcifications	
		Number	Per cent
Total	181	79	43.6
Under 5	12	..	...
5-9	55	21	38.2
10-14	87	46	52.9
15-19	27	12	44.4

It is apparent from this chart that reactivity to histoplasmin occurs at an earlier age than the appearance of calcium in the lungs or reactivity to tuberculin. The curves of the appear-



THE PREVALENCE OF REACTORS TO HISTOPLASMIN AND TUBERCULIN AND OF PULMONARY CALCIFICATION BY AGE GROUP

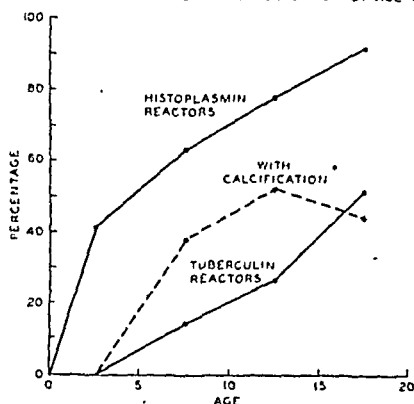


CHART 1—The Prevalence of Positive Reactions to Histoplasmin and Tuberculin and Pulmonary Calcification by Age Groups

ance of the calcium depositions and histoplasmin reactivity are parallel except in the last age group. This falling off of the prevalence of calcium in the lungs will be commented on later. The relationship in the height of the histoplasmin reaction curve and that of calcium deposition is such as would be expected if calcium was being laid down in the healing of lesions responsible for the appearance of the histoplasmin sensitivity.

There was no sex difference in reaction to histoplasmin, males showing sensitivity as frequently as females in all age groups.

Table 5 reveals the number and percentage of children with calcifications according to reaction to tuberculin and histoplasmin.

This table shows that 20, or 55.6 per cent, of 36 children who reacted both to histoplasmin and tuberculin had pulmonary calcification, that 48, or 49.5 per cent, of 97 who reacted to histoplasmin but not to tuberculin had pulmonary calcification. In the group who were positive to tuberculin but not to histoplasmin 3, or 33.3 per cent, of 9 showed pulmonary calcification. The number involved in the last category is so small that significant deductions are not warranted but they suggest that pulmonary calcification occurs less commonly in relationship to tuberculin sensitivity than in relationship to histoplasmin sensitivity. That calcification should occur most commonly in relationship to combined sensitivity to tuberculin and histoplasmin is only to be expected as there is no reason for their being exclusive.

There are, as shown by Table 5, 8 individuals who show calcification in the absence of sensitivity to either tuberculin or histoplasmin. They comprise 10 per cent of the group and are 4.4 per cent of the whole group.

These 8 individuals were further studied to see if an explanation could be found for this occurrence. Their tuberculin tests were stepped up to 1.0 mg.\* This brought out clear-cut sensitivity in 3 of the cases. The chest

\* The children in the group who had failed to react to 0.1 mg. of tuberculin had been retested with 1.0 mg. No other significant discrepancies were found.

TABLE 5

Number and Percentage of Tennessee Children with Calcifications According to Reaction to Tuberculin and Histoplasmin

Type of Reaction	Number	Per cent of Whole Group	With Calcifications	
			Number	Per cent of Reaction Group
Total	181	100.0	79	....
Tuberculin + Histo. +	36	19.9	20	55.6
Tuberculin + Histo. —	9	5.0	3	33.3
Tuberculin — Histo. +	97	53.6	48	49.5
Tuberculin — Histo. —	39	21.5	8*	20.5

\* See Table 6 corrected after restudy by Roentgenogram of chest, repeat histoplasmin and 1.0 mg. tuberculin tests.

TABLE 6

*Number and Percentage of Tennessee Children with Pulmonary Calcification According to Their Reaction to Tuberculin and Histoplasmin Corrected for 14 x 17 Inch X-ray Film Interpretations and Sensitivity to 1.0 mg. of Tuberculin*

Type of Reaction	Number	Per cent of Whole Group	With Pulmonary Calcifications	
			Number	Per cent of Reaction Group
Total	181	100.0	78	....
Tuberculin + Histo. +	36	19.9	20	55.6
Tuberculin + Histo. —	12	6.6	5	41.7
Tuberculin — Histo. +	97	53.6	48	49.5
Tuberculin — Histo. —	36	19.9	5*	13.9

\* The chest films showing doubtful calcification were included as positive. If the two doubtful calcifications were excluded, the per cent of the group showing calcification falls to 8.3.

roentgenograms were rechecked on 14 x 17 films and this revealed that one of the 1.0 mg. tuberculin reactors had a negative chest film. There were also 2 individuals negative to both tuberculin and histoplasmin who had doubtful calcification with the larger film. (The restudy of the group included retesting to histoplasmin with the same strength of antigen. This brought out one clear-cut positive reaction whose inclusion in the negative group must have been an observational error. This individual was accordingly placed in the histoplasmin-positive reaction group and he is included as such in the preceding tables.)

Table 6 shows the results of applying the corrections noted above.

An analysis of the 78 children with

pulmonary calcification is shown in Table 7.

It may be seen from Table 7 that of 78 children with pulmonary calcification, 25, or 32 per cent, reacted to 1.0 mg. or less of tuberculin. (This corrects to 23, or 29.5 per cent, if the doubtful calcifications are excluded.) There were 53 children who did not react to tuberculin, more than twice as many as did react. Of the whole group, 68, or 87.2 per cent, reacted to histoplasmin. As a whole there were almost three times as many children reacting to histoplasmin as children reacting to tuberculin. Only 6.4 per cent of the group failed to react to either tuberculin or histoplasmin.

It appears from these figures that most of the pulmonary calcifications

TABLE 7

*Histoplasmin and Tuberculin Reactions in 78 Children with Pulmonary Calcifications*

	Number	Per cent of Whole Group
Histoplasmin + Tuberculin +	20*	25.6
Histoplasmin + Tuberculin —	48	61.5
Sub-total Histoplasmin +	68	87.2
Tuberculin + Histoplasmin +	20*	25.6
Tuberculin + Histoplasmin —	5	6.4
Sub-total Tuberculin +	25	32.0
Histoplasmin — Tuberculin —	5	6.4
	5	6.4

\* These groups represent the same individuals. They are included twice in the table to make the sub-total groups correct.

Plate No. 1



occur in individuals who react to histoplasmin. The concomitant occurrence of tuberculin sensitivity seems to increase slightly, not greatly, the probability of finding calcium deposits in the lungs.

#### X-RAY FINDINGS

While we do not propose at this time to analyze critically the roentgenographic manifestations of disease found in these children, there are certain points which can be mentioned.

We are not able to distinguish with

any real degree of certainty the difference between the lesions found in the four reaction type groups who show pulmonary lesions. We are able to note some changes which recurred frequently. In general, one may say that the lesions found in conjunction with positive histoplasmin tests tended to be multiple. Frequently there were several bilateral peripheral foci of calcium deposition. The lesions found in those positive only to tuberculin in contrast tended to be single peripheral foci and as a rule only one lymphatic course

Plate No. 2



back to the hilar nodes was involved. Furthermore, there was less tendency for multiple hilar glands to show calcium deposition in those without histoplasmin sensitivity. Another observation was that, while there might be considerable irregularity of the calcium plaque in the tuberculin sensitive individuals, their glands did not show the discrete multiple button-like foci of calcium deposition commonly seen in those sensitive to histoplasmin. These findings are to be subjected to a detailed analysis and will be published else-

where. Some of the differences between the tuberculin and histoplasmin sensitive individuals are illustrated by the following reproductions of the x-ray films. Plate No. 1 shows a typical example of the type lesion found in a tuberculin-sensitive, histoplasmin-negative individual. Plate No. 2 shows an example of the lesions found in a histoplasmin-positive, tuberculin-negative individual.

#### DISCUSSION

In the first section of this paper we

have reviewed the literature relating to the finding of pulmonary calcification, lesions usually interpreted as indicative of tuberculosis, in people who are not sensitized to tuberculin. These studies<sup>2-17</sup> show that, while the problem may be widespread, there is a much greater prevalence of this phenomenon in the area of the eastern slope of the Mississippi River basin and the adjacent states of the western slope south of Iowa than in the rest of this country. The prevalence of pulmonary calcification varies from place to place within states and from state to state within this area. In this general area the overall prevalence of pulmonary calcification varied from 27 per cent<sup>12</sup> in Ohio to 83 per cent<sup>13</sup> in Tennessee. Of these calcified lesions only from 10 to 50 per cent were explainable on the basis of tuberculin sensitivity. Twenty-four to 45 per cent of the children in the age groups reported showed pulmonary calcification without tuberculin allergy. These studies have been interpreted variously by different authors, but in some instances<sup>9, 10</sup> they have been cited as evidence that the tuberculin reaction is not a satisfactory epidemiological index of tuberculous infection, more than half of the children who had roentgenographic evidence of disease failing to react to tuberculin even at levels of 1.0 mg. That this pulmonary calcification in tuberculin insensitive children was due to some other infection has been suspected by those who see these patients, but no one has until recently been able to incriminate any specific etiological agent for this phenomenon in this section of the United States. The observations of Gass<sup>13</sup> and his associates on the development of pulmonary calcification while the children were under observation and its occurrence without showing tuberculin sensitivity during the period of observation is highly significant. It seems incredible that

tuberculin sensitivity, a tissue sensitization, could develop and disappear with regularity in periods as short as two years. This observation offered the first substantial evidence that some infection other than tuberculosis might be the cause of this widespread, unexplained pulmonary calcification.

A pilot survey of the reactions of children in this section to coccidioidin with completely negative results enabled us to conclude with reasonable certainty that infection with *Coccidioides immitis* is not etiologically related to this problem of pulmonary calcification. There is no evidence that coccidioidomycosis occurs in Tennessee.

The preliminary skin tests to histoplasmin of children admitted to the pediatric ward of Vanderbilt University Hospital offered the first substantial suggestion that *Histoplasma capsulatum* might be of etiologic significance in this finding. This possibility was quickly brought into focus by the work of Palmer.<sup>20</sup> Using already accumulated information concerning the tuberculin reactions and the presence of pulmonary calcification in cadet nurses as a background, he studied their response to histoplasmin. His study shows considerable correlation between the presence of unexplained pulmonary calcification and histoplasmin sensitivity.

In the study of a group of 181 children reported here, we have found that some of the calcium deposits found in the lungs of Tennessee children are attributable to tuberculin sensitivity, as might be expected. We have also found, however, that much more of it occurs in association with sensitivity to histoplasmin. Not only is there this association between sensitivity to histoplasmin and pulmonary calcification, but the age at which sensitivity to histoplasmin develops and the age at which calcification appears are in such relationship that they might be cause and

effect, while the age at which tuberculin sensitivity appears lags far behind the deposition of calcium. Gass<sup>13</sup> and others have commented on the fact that these unexplained calcium deposits appear early in life. We have found that the development of histoplasmin sensitivity likewise occurs early in life.

In Chart I there appears in the last age group a divergence between the prevalence of histoplasmin and tuberculin sensitivity and the prevalence of pulmonary calcification. There is a falling off of the prevalence of calcification from the 10 to 14 year group to the 15 to 19 year group. Gass<sup>13</sup> and his associates have observed this phenomenon in certain groups in their studies. They have suggested that this might be due to increasing difficulty in securing good definition in the hilar areas of older subjects. Harrison<sup>31</sup> has also observed that there are less calcium deposits in the chests of adults in Williamson County than in their children. These findings are interpreted as indicating that some calcified lesions may be absorbed in post-adolescence and early adult life.

Any discussion of the results of a study involving skin tests inevitably brings up the question whether or not a reaction to the antigen in use is indicative of preceding infection with the organism from which the antigen was derived. With the tuberculin test, time has settled this question. There is no infection of clinical significance which gives nonspecific responses. With antigens derived from fungi, this is not true. There has already been demonstrated both in infected animals and in man crossed immunologic responses to coccidioidin and an antigen derived from *Haplosporangium parvum*, and the studies of Smith<sup>19a</sup> suggest that there may be a relationship between both of these antigens and some fungus responsible for sensitization of men from the

area where "non-tuberculous benign pulmonary calcification" is most common.

From our limited experience we know that a proved infection with *Histoplasma capsulatum* in an infant 5 months of age led to the development of sensitivity to our antigen and to reactions qualitatively similar to those observed in contacts and the individuals here reported. We have been able to confirm the observations of others<sup>27, 28</sup> that antigens derived from filtrates of broth cultures elicit skin reactions in infected laboratory animals.

These observations do not, of course, prove that the association between "non-tuberculous benign pulmonary calcifications" and histoplasmin sensitivity is indicative of an etiological relationship between *Histoplasma capsulatum* and the infection which produces the lesion that leads to the calcium deposition. We are in agreement with Palmer that this may well be the result of some other fungous infection whose causative organism has an antigen common or closely related to the antigenic complex present in histoplasmin.

These observations, however, when taken in conjunction with certain known facts concerning the distribution of fatal cases<sup>25</sup> of histoplasmosis suggest the possible etiologic relationship between "non-tuberculous benign pulmonary calcifications" and a benign form of histoplasmosis.

That histoplasmosis has never before been reported except as a fatal infection does not preclude the possibility of benign forms occurring or even being common. Histoplasmosis may well be in a state similar to that occupied by coccidioidial granuloma before Dickson and Gifford<sup>32</sup> showed that benign forms of the disease were common.

Another fact concerning histoplasmin as a skin testing antigen is worthy of comment. The high prevalence of positive reactions to the antigen robs it of

much significance in relationship to clinical infection. While a negative test may be of some value in excluding the possibility of histoplasmosis, a positive test would not be significant except possibly in an infant.

The epidemiologic studies here reviewed strongly point to the assumption that much of the pulmonary calcification of this region is non-tuberculous in origin. The nature if not the exact etiological agent responsible for these lesions is suggested by the study of Palmer and that reported here. There remain to be developed techniques which will enable us readily to isolate and identify the true etiological agent and to develop other tests for demonstrating immunologic reactions, such as precipitin and complement-fixing tests. There is further need for observations on the development of skin sensitivity to histoplasmin. Careful observations in infants and young children may enable us to describe clinically the infection which precedes the development of sensitivity.

#### SUMMARY AND CONCLUSION

1. A chronological review of the extent and degree with which calcification occurs in the chests of persons insensitive to tuberculin has been made.

2. A pilot survey of sensitivity to coccidioidin indicated that coccidioidomycosis is not related to this problem in Tennessee.

3. We report the clinical and indirect reasons for suspecting the relationship of histoplasmosis to the problem.

4. Preliminary studies concerning the development of histoplasmin are noted.

5. A possible example of a non-fatal infection with *Histoplasma capsulatum* is reported.

6. A study of the chest roentgenograms and the skin sensitivity to histoplasmin and tuberculin of 181 children from middle Tennessee suggests an immunologic relationship between histoplasmin sensitivity and the problem of pulmonary calcification.

7. The significance of the reviewed studies in relationship to the findings of our study and the study of Palmer is discussed.

#### REFERENCES

1. Holt, L. Emmett, and McIntosh, Rustin. *Dis-*

*eases of Infancy and Childhood*. D. Appleton-Century, 11th ed., 1940.

2. Opie, Eugene L., and McPhedran, F. Maurice. The Contagion of Tuberculosis. *Am. Rev. Tuberc.*, 14:347, 1926.

3. Hetherington, H. W., McPhedran, F. Maurice, Landis, H. R. M., and Opie, Eugene L. A Survey to Determine the Prevalence of Tuberculosis Infection in School Children. *Ibid.*, 20:421, 1929.

4. Barnard, Margaret Witter, Amberson, J. Burns, Jr., and Loew, Marion Franklin. Tuberculosis in Adolescents. *Ibid.*, 23:593, 1931.

5. Crabtree, James A., Hickerson, William D., and Hickerson, Virginia Pope. Tuberculosis Studies in Tennessee. *Ibid.*, 28:Suppl. No. 6, 1933.

6. Nelson, Waldo E., Mitchell, A. Graeme, and Brown, Estelle W. The Intracutaneous Tuberculin Reaction Associated with Calcified Intrathoracic Lesions. *Ibid.*, 37:311, 1937.

7. Gass, R. S., Gauld, R. L., Harrison, E. F., Stewart, H. C., and Williams, W. C. Tuberculosis Study in Tennessee. *Ibid.*, 38:441, 1938.

8. Crimm, Paul D., and Short, Darwin M. Tuberculin Anergy in Cases with Pulmonary Calcifications. *Ibid.*, 39:64, 1939.

9. Lumsden, L. L., Dearing, W. P., and Brown, R. A. Questionable Value of Skin Testing as a Means of Establishing an Epidemiological Index of Tuberculous Infection. *A.J.P.H.*, 29:25, 1939.

10. Lumsden, L. L., and Dearing, W. P. Epidemiological Studies of Tuberculosis. *A.J.P.H.*, 30:219, 1940.

11. Gass, R. S., Murphy, William J., Harrison, E. F., Puffer, Ruth, and Williams, W. C. Tuberculosis Infection in Relation to Tuberculin Sensitivity in School Children. *A.J.P.H.*, 31:951, 1941.

12. Olsen, B. J., Wright, W. H., and Nolan, M. O. Epidemiological Study of Calcified Pulmonary Lesions in an Ohio County. *Pub. Health Rep.*, 56:2105, 1941.

13. Gass, R. S., Harrison, E. F., Puffer, Ruth E., Stewart, H. C., and Williams, W. C. Pulmonary Calcification and Tuberculin Sensitivity among Children. *Am. Rev. Tuberc.*, 47:379, 1943.

14. Long, Esmond R., and Stearnes, William H. Physical Examination at Induction. *Radiol.*, 41:144, 1943.

15. Dillon, Ann, Gass, R. S., Hubbard, W. W., and Harrison, E. F. Results of the High School Tuberculosis Program in Tennessee. *J. Tennessee M. A.*, 38:97 (Apr.), 1945.

16. Cox, Alvin J., and Smith, Charles Edward. Arrested Pulmonary Coccidioidal Granuloma. *Arch. Path.*, 27:717, 1939.

17. Aronson, Joseph D., Saylor, Robert M., and Parr, Emma I. Relationship of Coccidioidomycosis to Calcified Pulmonary Nodules. *Arch. Path.*, 34:31, 1942.

18. Emmons, C. W., and Ashburn, L. L. The Isolation of *Haplosporangium parvum* N. Sp. and *Coccidioides immitis* from Wild Rodents. Their Relationship to Coccidioidomycosis. *Pub. Health Rep.*, 57:1715, 1942.

19. Smith, Charles Edward. Coccidioidomycosis. *M. Clin. North America*, 27:790 (May), 1943.

19a. Smith, Charles Edward, Stanford University, personal communications.

20. Nelson, Waldo E., Dept. Pediatrics, Temple University, Philadelphia, personal communications.

21. Author's unpublished data.

22. Meleney, Henry E. Histoplasmosis (Reticulo-endothelial Cytomycosis): A Review. *Am. J. Trop. Med.*, 20:603 (July), 1940.

23. Beamer, Parker R., Smith, Edward B., and Barnett, Henry L. Histoplasmosis. *J. Pediat.*, 24:270 (Mar.), 1944.

24. Hild, Jack R. Histoplasmosis. *Am. J. Dis. Child.*, 63:131 (Jan.), 1942.

25. Parson, Robert J., and Zarafonetis, C. J. D. Histoplasmosis in Man. *Arch. Int. Med.*, 75:1, 1945.
26. DeMonbreun, W. A. The Cultivating and Cultural Characteristics of Darling's *H. capsulatum*. *Am. J. Trop. Med.*, 14:93, 1934.
27. Zarafonetis, Chris J. D., and Lindberg, Robert B. Histoplasmosis of Darling. Observations on Antigenic Properties of Causative Agent: Preliminary Reports. *Univ. Hosp. Bull., Ann Arbor*, 7:47, 1941.
28. Van Pernis, Paul, Benson, Miriam E., and Holinger, Paul H. Specific Cutaneous Reactions with Histoplasmosis. *J.A.M.A.*, 117:436, 1941.
29. Palmer, Carroll E. Nontuberculous Pulmonary Calcification and Sensitivity to Histoplasmin. *Pub. Health Rep.*, 60:513 (May), 1945.
30. Author's unpublished data.
31. Harrison, E. F., Tennessee Department of Public Health, personal communications.
32. Dickson, Ernest C., and Gifford, Myrnie A. Coccidioides Infection (Coccidioidomycosis). *Arch. Int. Med.*, 62:853, 1939.

---

## UNRRA China Project Expands

According to an announcement from the Washington headquarters of the United Nations Relief and Rehabilitation Administration, 18 doctors, sanitary experts, and nurses have joined the staff of UNRRA in Chungking. These persons have conducted special training programs for Chinese experts and brought under control a serious cholera epidemic and begun action on requests for speedy recruitment of approximately 200 additional medical persons for field operations. The program is under the direction of Leland A. Powers, M.D., M.S.P.H., formerly the State Health Officer of Washington. The program is being developed in cooperation with Dr. P. Z. King of the Chinese National Institute of Health, Dr. Chang Wei, and Dr. Yao Ke-fang, among others.

Among the medical workers sent by UNRRA in answer to urgent requests for help in the cholera epidemic are Drs. James Watt, U.S.P.H.S., Hobart A. Reimann, Jefferson College Medical Hospital, Philadelphia, William A. Frye, Nashville, Herbert K. Abrams, Chicago, Eldred K. Musson, Chicago, Carlton B. Chapman, Boston, and W. J.

Wood, former assistant chief of the Medical Services in the Canadian Army. Two sanitary engineers, Conrad P. Straub, Irvington, N. J., and Franz J. Maier, Jackson Heights, N. Y., accompanied the doctors.

Other staff recruited in the United States and already in Chungking include Sanitary Engineer Robert Burden, Cambridge, Mass., Dr. Leo Eloesser of Stanford University, Adelia L. Eggestein of Minneapolis, and Ruth Ingram, formerly of Peiping. Also included are Dr. Victor A. Sutter of El Salvador and Drs. Frederick A. Jensen formerly of Vienna, and Ernst Singer of Czechoslovakia.

According to the UNRRA announcement, it has been estimated that in the next four years China will have to train 34,000 technicians. UNRRA is attempting to fill present requests from China for 200 medical field workers and has set a recruitment goal of 100 medical men and 30 nurses by the end of the current year. Persons interested in the program should communicate with the UNRRA office, 1344 Connecticut Ave., Washington, D. C.



# On Making Public Health Positions More Attractive\*

JOSEPH W. MOUNTIN, M.D., F.A.P.H.A.

*Medical Director, U. S. Public Health Service, Washington, D. C.*

LIKE housekeeping, personnel administration is a job that is never finished. Each day recurring tasks must be performed, and periodically major readjustments are superimposed on this routine. Today, the great problem of public health organizations is that of meeting difficulties resulting from a shortage of qualified workers, both professional and nonprofessional. In many communities this shortage is so great that not even the minimum basic public health activities are being maintained.

Unfortunately, it is commonly supposed among health administrators that the termination of hostilities will automatically solve the problem; it is thought that former incumbents of public health positions will immediately return to their usual work, and that if more people are desired, they can be obtained with facility.

That there is insufficient analysis in these foregoing assumptions should be quite apparent to those familiar with public health administration. Of course, this drying up of the personnel reservoir may be attributed in large part to the war and its consequent demand for the services of the men and women of our country, but other controllable factors are involved that merit serious

consideration. In the first place, qualified public health people were not available in sufficient numbers even before the declaration of war, and since then very few new ones have been developed. Again, those that have remained on the job are getting older, and many have fallen out of the ranks, further depleting already inadequate numbers. As for public health people in military service, it should not be assumed that all of them will return to their previous positions, or that many demobilized persons not formerly in public health work will choose that sphere. In this latter connection the report, "Postgraduate Wishes of Medical Officers,"<sup>1</sup> published in the *Journal of the American Medical Association* is informative. In brief, an analysis of questionnaires returned by 21,029 medical officers revealed that only 110 desire post-war training in public health. Not all of these represent a post-war accession to this field; actually a high proportion are thus merely indicating additional training they desire before resuming their usual work. And there is no assurance even that all of these will reënter such work.

For some time, our educational institutions cannot be of great help in meeting current personnel shortages. During the war full-length professional education of engineers and scientists had all but come to a stop. In lesser degree, the same may be said of the

\* Delivered before the Forty-third Annual Conference of State and Territorial Health Officers with the U. S. Public Health Service, Washington, D. C., April 10, 1945.

training of physicians, since under war conditions relatively few candidates were available to enter pre-medical courses. True, a large amount of wartime educative training has been carried on at schools and colleges in conjunction with various branches of the armed forces, but it is training directed toward the end of enabling the individual to meet particular situations of limited scope that might be expected to arise in the conduct of military operations. There is one notable exception to this general situation, and that is the training of young women for nursing. The Cadet Nurse Training Program has been a success. Largely through its operation, the number of candidates entering upon initial training throughout the country has increased from the pre-war level of about 35,000 annually to approximately 65,000. There is no question but that these nurses constitute an important post-war public health potential, but it must be observed that they are being trained through an accelerated course, and that certain studies have been reduced or eliminated, studies that, in the past, have proved to be of great value in supplying a broader background for participation in the general public health program.

So much for training, and what may be expected in the way of new public health personnel in the near future. With the exception of nurses and possibly technicians, there just won't be any, for some time. Right now there is a world-wide shortage of physicians, and no one can tell when new ones will be turned out in sufficient numbers. The prospects for engineers may be somewhat better, but they are not too bright. Additional first-class research workers are not likely to become available for some time.

A great demand from all sources for well qualified people may be expected, at least in the early years

of the peace. Ours is the only great nation whose capacity to produce has remained unimpaired, and the demand for our goods will probably be world-wide. In order to meet this demand, manufacturing industries, at least for a time, will have to work at top speed. And along with a high level of activity in the factories, there may be anticipated a heavy demand for transportation, communication, and various forms of personal service. In other words, public health will be looking for personnel in a highly competitive market.

To meet this competition, public health positions must be made more attractive than they have been. It is that point in particular I wish to emphasize. But how can these jobs be made more attractive? The principal factors that determine the attractiveness of any job seem rather obvious. They are, first, financial remuneration; second, selection on merit; and third, opportunity for professional development. On these three scores, it cannot be said that public health positions have in the past invited favorable consideration, nor can it be maintained that responsible public health administrators have faced the situation frankly. Unfortunately there has prevailed the tradition not only of housing public health staffs physically in the basements, but also of placing them at the bottom of the salary scales. Merit as a basis for employment and promotion frequently yields to preferential treatment of one type or another, and opportunity for professional development in public health often is limited indeed. There has been a feeling on the part of too many that public health positions are in the nature of a "call" to the particular individual, and that no other consideration need be entertained. It seems likely that with the din of industry and the jingle of coin as distractions this "call" will con-

tinue to go unheard by many desirable candidates.

A start on a well planned program for making public health positions more attractive is long overdue. Such a program requires more than setting up qualifications for applicants—it also means getting down to what the job has to offer. A necessary and desirable step in bringing about optimum employment conditions in public health service is the institution and extension of an impartial method for the selection and advancement of personnel—a civil service or a merit system. Such a plan when instituted by statute may be referred to as “civil service”; when originated by administrative rule, it is often called a “merit system.” This is a rather fine distinction between terms, but in either case, the objective is the same—to apply the best and most enlightened principles of personnel administration to public service.

State civil service systems and their counterpart, merit systems, have followed a long and arduous course since the first state civil service law was passed by New York in 1883. Massachusetts followed with such a law two years later, after which 20 years elapsed before the States of Illinois and Wisconsin, in 1905, adopted laws defining the conditions of public employment. To date, such laws establishing state-wide civil service have been enacted in 20 states; 6 of these have constitutional provisions on which the system rests in whole or in part.

State merit systems have originated under somewhat different circumstances from state civil service systems. With one or two exceptions, states where merit systems exist have been moved to their establishment by the requirements of federal laws and regulations attached to financial payments to the states for “grant-in-aid” programs under the Social Security Act. As a result of these provisions 31 states and

territories have established merit systems. The effect of federal requirements may be deduced from the fact that in 1940 alone, the year immediately following their adoption, 12 states established merit systems affecting public health personnel.

In the interest of promoting and maintaining sound personnel policies, federal administrative agencies are authorized to examine civil service or merit systems of states and territories receiving “grant-in-aid” funds. Such systems when submitted by the states and territories are considered by federal agencies under two headings, and approval or disapproval is given either or both of these. The two parts thus examined are: (1) the basic law or rule, (2) the classification and compensation plan. The score to date for 51 states and territories with the U. S. Public Health Service is:

	<i>Reviewed    Approved</i>	
Law or rule.....	50	45
Classification and compensation plans .....	46	20

It is obvious that the most marked failures to come up to par have appeared in classification and compensation plans. And this is precisely the vital point where work must be done if success is to be achieved in making public health positions more attractive. In addition, the civil service laws of four states were judged defective in one or more respects. Also, one state and one territory operating a merit system have not had their implementing rules approved.

The Public Health Service does not attempt to tell states how much they shall pay their appointees, but the desirability of generous compensation as an aid in employing the more competent personnel is stressed. However, in determining the necessary qualifications of candidates for the basic public health positions of medical officer, nurse, and

engineer, the Public Health Service does insist that the states require certain predetermined attainments as a condition of appointment. Beyond that, also in the matter of job specifications, is the stipulation that positions carrying titles such as biologist, chemist, zoölogist, be filled only by people who have pursued degree courses with such subjects as majors. The adoption of a retirement plan, while not obligatory, is strongly urged, since it contributes effectively to the initial employment and the retention of desirable personnel. A source of great disappointment is the fact that less than half of the states have thus far devised such a plan.

It is in the holding of qualifying examinations that performance by the states and territories has been least satisfactory. To date, with the exception of a small number having well established civil service agencies, few have held examinations recently for professional personnel employed in public health positions. Usually examinations held have been designed for clerical, stenographic, and fiscal employees. Following them come the nurses. This sequence can be accounted for not only by the fact that nurses are most numerous among the other classified members of health department staffs, but also it is largely due to the coöperation and sympathy with the merit system plan shown both by individual nurses and the National Organization for Public Health Nursing. There is no apparent reason why persons of other professional categories have been examined so rarely. Certainly all should realize that the ultimate success of personnel administration on a merit basis for public health personnel will depend in great measure on the active support of those professional groups that are represented in the staffs of health departments. The current scarcity of suitable candidates for

vacant positions need not act as a deterrent against examining and certifying acceptable present incumbents, who meet technical and other qualifications.

Shortly after the adoption of the federal requirement that systems of personnel administration be set up on a merit basis, the need arose for suitable test items and up-to-date examination procedure which would aid in the selection of persons capable of performing the duties of the positions. In order to avoid setting up special machinery at the federal level for assisting the states in preparing this material, the help of the American Public Health Association was requested jointly by the U. S. Public Health Service and the Childrens Bureau of the U. S. Department of Labor. That Association very graciously undertook this exceedingly difficult task. A small, highly competent staff has been employed to carry on the program, but they have worked in close coöperation with health officers, nurses, engineers, and others representing the several specialties in public health who have contributed their time and assistance on a voluntary basis. Up to the present, this unit has prepared 125 separate sets of examinations for positions in public health nursing, laboratory work, sanitation, and health administration. Twenty states and two cities have made use of this examination material. Additional test items for still more extensive use are now available for all grades of the foregoing fields of work.

An obstacle which has stood in the way of even more extensive use of this material has been the cost of making it available. This is a mistake and most unfortunate. Anyone who takes the time to investigate the matter can readily assure himself that the fees charged for this service compensate for only a very small fraction of the effort that is involved.

The best way to compare qualifications of applicants for positions is through the use of standardized test items. There is little hope for reciprocity between states and communities in the acceptance of credentials presented by candidates for public health positions unless it be on the basis of certification for positions with similar job specifications and common examination techniques. Such reciprocity is necessary to that freedom of movement among health jurisdictions which professional public health workers desire above all else. At present, the worker, and particularly the health officer, usually is required to be a resident of the state, and not infrequently he must also be a resident of the local community where he wishes to be employed. Actually, once employed, he is practically frozen on the job, or at least fixed within the system of which the local position is a unit. Excessive mobility, of course, is not desirable, but at least the feeling that one might move to another position if he so desired is mighty comforting. This movement should be planned so as to broaden the horizon of the individual and enrich his experience, and not altogether to gain a larger salary. Mobility should be permitted both up and down within a state health structure, and laterally among states. The federal agencies also could well be brought into the exchange so that federal, state, and local employees might acquire familiarity with the requirements of related positions. In fact, upon such an exchange may hinge the final success of our present federal-state-local partnership in public health.

In addition to stabilizing employment for public health workers and adjusting compensation, their jobs must be made otherwise rewarding. A person should feel that he is performing useful work and that he is utilizing to good advantage the knowledge and

skills he possesses. The traditional routine of a small local health department is often quite stultifying, to say the least. In any situation, a sense of frustration naturally comes with the discovery that unsatisfactory conditions cannot be followed by the application of corrective measures. "Go and see your doctor," may be discreet advice to give parents on finding that their children need corrective work, but it does not impress the aggressive health officer or a discerning public as doing very much. Educational effort, such as this, has its place but it is not a satisfactory substitute for more tangible forms of remedial service. In many instances only by increasing the size of the health district and by encompassing within the public health program a wider range of activities will it be possible to provide necessary latitude for professional and technical development of the staff and permit placement of individuals according to their interests and capabilities.

Opportunities for employment should be extended to professional persons outside the traditional categories of physicians, nurses, and engineers. There is a broad group with good basic training in biology who have much to contribute, but are now largely ignored. Entomologists, in particular, can give fresh impetus to a fagging malaria control program. The newer insecticides and rodenticides open up still greater possibilities for control of disease-bearing vermin, and in this program chief reliance must be placed on entomologists. Unquestionably veterinarians have been snubbed by public health people. There are many diseases in animals transmissible to man which veterinarians are most competent to handle. They are especially familiar with animal food products, and should have many suggestions for improving food sanitation.

Another type of professional person whose activities are becoming of more and more importance to the public

health program is the health educator. The health educator is the vanguard of the advancing public health program. He is both psychologist and salesman. He goes directly to the people and shows them how and why they need public health measures. It is amazing, the tremendous strides taken by some of these people toward awakening the latent demand for public health services. Recently a local health officer from North Carolina reported that he had put on first one, then two, and finally three health educators, and that all were doing well. When asked if he was going to employ any more, he replied, "No, not until I can increase my general staff; the health educators have stimulated folks to the point where they are running our legs off!"

Up to the present time social workers have been used relatively little in the field of public health. The restricted scope of health program may account for this. However, with the inclusion of more extensive medical care in public health service, social workers, and especially medical social workers, should be of increasing value; and as mental hygiene expands, the psychiatric social worker will become indispensable.

A large part of the total public health job falls in the broad category of business administration: preparing estimates, hiring people, purchasing commodities, paying bills, keeping records, making reports, operating institutions, and the like. The general run of physicians and nurses, and to a lesser extent engineers, are not suited by interest or training for this field. Much of the inefficiency one encounters in public health can be attributed to the fact that good business methods have not been incorporated into administrative practice. Public health could well use competent business administrators.

Provision should also be made for extensive employment of persons aux-

iliary to the more strictly professional groups. To do this, public health must be broken down into component parts. On analysis one finds that seemingly complex operations contain many elements that can be segregated from the whole and set up as individual jobs to be performed by persons of less scientific training than formerly was thought necessary. By doing this, and using auxiliary workers, it will be possible, first of all, to effect economies, and second, to save the more highly trained people for their particular types of work. Moreover, this plan will afford employment to many persons who otherwise would be excluded from an important branch of public service.

There is, of course, the fear that auxiliary workers may not exhibit that fidelity to duty which is commonly associated with persons of professional outlook. Most health administrators have had painful experience with low-grade sanitary inspectors. The lay health visitor continues to be anathema to professional health workers in this country despite the fact that she has been the main reliance for home service abroad. Recent successful experience with lay venereal disease investigators indicates that our previous adamant position may not be altogether tenable. Now registered nurses have visions of aides just over the horizon whose only qualification is that they are motherly souls anxious to do good. Here again professional groups show an inveterate propensity to oppose developments which they believe contrary to their particular interest. When properly selected, trained, and supervised, people of limited technical background can do highly satisfactory work in certain fields of essential service. Also, experience has amply demonstrated that a guild spirit can be infused into those who follow the simpler crafts as well as those engaged in more intellectual pursuits.

Finally, all the jobs that are now available should be described and entered in suitable registers. The same should be done for the jobs that are likely to be established in the near future—that is, within perhaps the next few years. Already there are coming back from military services some well qualified persons looking for employment in public health and many others who might be induced to follow public health work as a career. They will wish to know exactly where these jobs are, what qualifications are prescribed, and the salary each position carries. With these facts at hand, anyone looking for employment, or anyone who wishes to be trained for a job, then can plot his course accordingly. For example, if a candidate wants to be a health officer in Alabama, or California, or New Hampshire, there should be readily available the information that will answer the very points that have just been enumerated.

Public health is entitled to a place

of importance and prestige among federal, state, and local social services. To maintain a level of performance in keeping with this ideal, it has need of individuals possessing the inherent attributes that are required for success in any responsible position. Public health is looking for essentially the same kinds of persons to act as supervisors, clinicians, research workers, and general staff workers as are employers generally. Administrators have no reason to expect that a fair proportionate share will enter the public health field unless there is a forthright examination and reexamination of the whole range of personnel policies and practices. Relying on the "call for service," and maintaining a lofty indifference to such mundane matters as compensation, promotion, professional advancement, security, and eventual retirement can only lead up a blind alley of narrowing usefulness.

#### REFERENCE

1. Lueth, H. C. Postgraduate Wishes of Medical Officers. *J. A. M. A.*, 127, 13:759-770 (Mar. 31), 1945.

# A Comprehensive Training Program for Public Health Personnel

GEORGE ST. J. PERROTT, F.A.P.H.A.

*Chief, Division of Public Health Methods, U. S. Public Health Service,  
Washington, D. C.*

FROM the immediate pre-war years to the present, the State and Territorial Health Officers have made an important contribution to the expanding training program for public health personnel. The major development of the pre-war period was the provision of training opportunities under the terms of the Social Security Act, which anticipated the shortage of trained personnel that would confront health departments seeking to organize or expand. The onset of war created new shortages of public health personnel, leading to the development of emergency training for replacements, and for the new personnel required in war emergency areas. War is providing an additional stimulus to the training program, as demobilization creates the need for the education and training of veterans entering employment in public health, or returning to pre-war jobs in this field. In recognition of the importance of this program, the Committee on Personnel of the State and Territorial Health Officers at the 1944 Conference pointed out the desirability of the appointment in the state health departments of a personnel officer "to follow through on this new re-training and reemployment program now while it is in a developmental stage."<sup>1</sup>

The next step is to prepare for the post-war period by the formulation and implementation of a *comprehensive* training program for the varied personnel required in an integrated national system of health and medical services. Some of you may recall the name of Lewis Meriam as an expert in the field of personnel training for the public service. Meriam's advice was: "Do not train for a specific class of positions without getting statistics, keeping statistics, watching statistics."<sup>2</sup> As a basis for the post-war training program, we must heed this advice: Get statistics on the number and types of public health personnel to be trained; and watch the statistics on the capacity of our schools of public health and other educational institutions to train them.

The content of the training program must be appraised and adapted to present and post-war needs. Is it providing sufficient training in administrative methods for the health officer of the future who may be called upon to direct a rural health center which includes a small hospital, and provides not only preventive services, but a complete program of home, office, and hospital care of the sick? Is it providing sufficient training for the average health officer of the present, who requires formal training in public administration as well as public health, and field experience prior to the assumption of his full duties?

---

\* Delivered before the Forty-third Annual Conference of State and Territorial Health Officers with the U. S. Public Health Service, Washington, D. C., April 10, 1945.



Another major responsibility of a comprehensive training program is the coordination of the federal, state, and local official health agencies, the national professional health associations, and other national nonofficial agencies in a plan of technical cooperation. Finally, a broad training program must be implemented by adequate financial aid.

At the suggestion of the Surgeon General, the Public Health Service in June, 1944, took the first step toward the development of such a comprehensive program by the organization of a Committee on the Post-war Training of Public Health Personnel, of which I have had the privilege of serving as Chairman. It is on the recommendation of that committee that this session of the present Conference has been arranged, for the purpose of describing the nature of the comprehensive training program we envisage, and the more urgent problems requiring attention.

#### SCOPE OF A COMPREHENSIVE TRAINING PROGRAM

With respect to scope, a comprehensive personnel training program resembles the program of a local agency in three of the elements with which it is concerned, i.e., recruitment of personnel, induction training, and in-service training. However, the scope of the comprehensive national training program widens to embrace a fourth major field, which may be described as *preëntry*, or *preëmployment*, or *pre-service training*. We may review the relation of four aspects of the overall personnel training program.

##### I. PREEMPLOYMENT TRAINING

Under preëmployment training is included the basic professional or technical training required to prepare prospective entrants to employment in the public health field. Such training may be limited to academic study or to

field practice, or may include a combined period of academic and field training. In a comprehensive personnel training program there would be a triple responsibility to insure, (1) training adequate in scope and content, (2) educational institutions and field centers adequate in capacity to meet the national need, and (3) the recruitment of trainees whose personal and educational qualifications adapt them to successful practice in the field in which they specialize.

The schools of public health occupy the central position among the educational institutions in this field, being concerned with preëntry training as well as with training following induction.

Dr. Lowell Reed, Dean of the School of Public Health at Johns Hopkins University, has recently summed up an extensive experience both at his own institution and at other schools of public health.<sup>3</sup>

The rôle of the school of public health has turned out to be somewhat different from that anticipated originally. Starting with the intention of training medical personnel to become health officers, the schools have found fewer health officer applicants than expected and more persons with other objectives seeking training in public health administration. These include administrators of special services—tuberculosis, venereal disease, maternal and child health, as well as such other professional workers as dentists, nurses, and sanitary engineers.

Contrary to what was originally anticipated also, the schools cannot serve as procurement agencies. Procurement must be related to employment opportunity; the schools cannot give jobs or guarantee jobs. The states must recruit trainees, and the local opportunity for employment is the strongest inducement to seek training.

Nor is it feasible, as was first thought, for the schools to set up field training

centers other than for field laboratory exercises, observation and special studies.

Effective field training must provide the trainee the opportunity for assuming responsibility for work done. Only the official health department, state or local, can offer field training with responsibility attached. A single health jurisdiction, however, cannot absorb a group and assign responsibility. This overloads the department beyond its capacity.

Which health departments are suitable as training centers? The schools cannot settle this problem. Approval or accreditation is a function better suited to a professional agency such as the American Public Health Association.

Today the schools of public health provide a basic core of instruction in public health problems and administration but also provide opportunities for clinical training in special fields such as pediatrics, tuberculosis, and syphilis.

While the schools of public health represent the major educational institutions in this field, it should be noted that a large number of colleges and universities, both in their undergraduate and graduate departments, contribute to preemployment training, providing basic and advanced curricula for public health nurses, sanitary engineers, laboratory workers, and other professional and technical public health personnel.

An intelligent evaluation of needed academic curricula presupposes the existence of complete statements of the training requirements of the varied positions in the public health field. We owe to the American Public Health Association and, in particular, to its Committee on Professional Education, under the able leadership of Dr. William Shepard, the development of a series of statements on the educational qualifications of public health personnel which meets this need.

A comprehensive training program

would include funds to support job analyses. It is quite possible that new or modified curricula are needed today to meet the needs of the field. It is notable, for example, that the necessity for requiring the completion of an approved program of study in public health nursing by every nurse participating in the public health program is being questioned by leaders in the field of public health nursing, who, furthermore, contemplate the extensive utilization of practical nurses as assistants to fully trained public health nurses.<sup>4</sup> It seems possible that sub-professional personnel could be employed in additional public health activities. However, the adaptation of preemployment training to meet such new personnel needs will require a well planned program of personnel research.

At present trainees are selected without very good criteria of their probable success after training. Several methods of recruitment are possible:

1. A short orientation period before admission to formal training. This procedure has been used with considerable success by the New York Department of Health.

2. National recruitment by the Public Health Service. Such a method of recruitment is being practised now for the training of health educators. In general, the trainees have been superior individuals. Some states that are anxious to recruit qualified health education trainees have asked the Public Health Service to send them the application blanks of individuals living in their state who might accept training stipends from the state.

3. Development of aptitude tests as a basis for recruitment.

In many fields it is possible to test the aptitude of an individual and measure objectively his chances of success in a given profession. No research to determine what can be done with this same approach in the public health profession has been attempted, but it is a problem worthy of consideration.

## II. RECRUITMENT OF PERSONNEL

Improvement of the terms of employ-

ment in public health through promotion of the merit system represents one of the essential steps to be taken in a long-term program to attract an adequate number of personnel to this field. The importance of this measure is fully recognized by the members of this Conference. An important approach to recruitment can be made through the medical schools and schools of nursing by appropriate emphasis on the opportunities for specialization in public health administration or service in a special field of disease control. One of the newer possibilities is recruitment among veterans. As a contribution to this aspect of recruitment, the Committee on Professional Education of the American Public Health Association has compiled a summary of the training requirements for professional and technical public health personnel for the use of employment counsellors.<sup>5</sup> The second step in the veterans' program, a survey of present and post-war openings in state and local health departments, is now being completed by the Public Health Service. Financial assistance in the form of scholarships and fellowships to selected students who could not personally finance basic public health training should be provided as an aid to recruitment.

### III. INDUCTION TRAINING

I use the designation "induction training" to include the training financed under Titles V and VI of the Social Security Act and the Venereal Disease Control Act, as well as the short courses devised to provide emergency training during the war. This training, provided to meet requirements which should have been satisfied before induction, should be distinguished from the in-service training of new employees which is an important element in every well planned personnel training program.

The pattern of this aspect of the

training program is generally familiar to the members of this Conference, and the proceedings of your previous meetings indicate your awareness of its defects. The preparation of personnel for the expansion of health departments promoted with Social Security Funds justified the pre-war emphasis on induction training and its continued emphasis under the modified terms enforced by the war itself. However, it should be an aim of the post-war period to restore gradually the balance that has been lost during the continuing shortage of trained personnel. Emphasis should be placed on complete academic and field training prior to employment rather than on training after induction either through short academic orientation or make-shift training on the job. This realignment will take place as soon as the pressure for personnel is relieved.

### IV. IN-SERVICE TRAINING

The purposes served by the in-service training program have been aptly summarized as follows:

1. To make up for deficiencies in technical and scientific information required for the job generally
2. To enlarge the outlook and understanding on the specific job
3. To acquaint the staff with the fundamentals of personal and public relationships in order to encourage smoother functioning of the day-to-day job
4. To keep the staff abreast of newer, technical, procedural and administrative developments as derived from experience in other jurisdictions<sup>6</sup>

A variety of methods has been used to promote these objectives, including the following:

1. Orientation course
2. Field orientation in a well organized health department or demonstration center
3. Conferences
4. Institutes
5. Staff meetings
6. Refresher courses
7. The more intensive type of practical experience comparable to the internship which

industry has developed for the training of executives

Field experience provided either as a device for selection of trainees or as a method of training has been discussed recently by New York State's Health Commissioner, Dr. Godfrey.<sup>7</sup>

Orientation of a trainee, in the belief of Dr. Godfrey, is helpful both to the trainee and the employer. The trainee needs an opportunity to assure himself that he is going to like a public health career. The employer, on his part, wants some inkling as to whether the trainee shows signs of being cut out for this sort of work.

Dr. Godfrey visualizes three types of induction courses:

1. Internship in a going concern (not a demonstration area)
2. Operational internship in a health department subsidized for special training purposes
3. Observational training in a well developed health department—a demonstration area

In any of these plans there are limitations. An operating department can absorb only a limited number of trainees without disrupting its own work. Neither can a subsidized health department with a special educational director, place any number of people in responsible positions, and the carrying of responsibility is needed in real training.

The time of internship or observation is an important factor. For orientation purposes at least three months is necessary for actual training; however, nine months is felt to be the minimum.

Dr. Godfrey feels that for orientation purposes, there should be no examination of the usual type in selecting applicants. He believes that not one officer, but a board of several should select applicants on the basis of their combined judgment.

The content of in-service training necessarily varies according to the needs

of the employee group, which may be newly inducted or composed of old employees, of administrative or service personnel, professional, technical or sub-professional workers. The field of instruction may be the general public health activities of the agency, those of a single class of personnel, such as public health nurses, or the activities in a specialized field such as the control of venereal disease, tuberculosis, or malaria and other tropical diseases.

Assistance in arranging for the approval of field training centers, the provision of necessary supervisory and educational staff, and the general planning of in-service training for state and local units could well be rendered by a central administrative agency in a national, coordinated program.

#### THE NATURE OF THE TRAINING PROGRAM

A survey made by the U. S. Public Health Service in July, 1945, indicated a total of about 20,000 full-time professional and technical workers in state and full-time local health departments. In addition, a total of 5,810 vacancies was reported of which 2,579 were being held for persons in the armed forces and 3,231 were "open" vacancies, making a total of about 25,000 established positions (Table 1). If this figure is corrected for an apparent under-enumeration of public health nurses and dental hygienists, it becomes about 29,000.

Long-range planning requires an estimate of the number of various types of personnel that will be needed to bring the nation's health services up to a level of adequacy. Emerson<sup>8</sup> has estimated that at a minimum, an additional 25,000 full-time personnel of all types will be required, including some 12,600 public health nurses, 1,350 professionally trained sanitation personnel, 1,100 skilled laboratory workers, 140 full-time dentists and 2,400 part-time den-

TABLE 1

*Estimated Number of Full-time Personnel in State and Full-time Local Health Departments and Existing Vacancies \**

Type of Position	Total Established Positions	Total Vacancies Plus Positions Held for Persons in Armed Forces	Positions Held for Persons in Armed Forces	Vacancies	
				Number	Per cent
	(1)	(2)	(3)	(4)	(5)
Health officer	1,219	300	176	124	10
Other M.D.'s	1,801	570	269	301	17
Public health nurses †	12,007	2,701	1,054	1,647	14
Public health engineers	770	382	244	138	18
Dentists	381	133	85	48	13
Dental hygienists †	95	25	5	20	21
Statisticians	396	80	21	59	15
Laboratory workers	2,996	587	192	395	13
Health educators	255	73	11	62	24
Veterinarians	423	70	40	30	7
Other sanitation personnel	5,002	889	482	407	8
Total.	25,345	5,810	2,579	3,231	13

\* Based on survey made by U. S. Public Health Service, July, 1945. Total estimated from returns received which were 80 per cent of all full-time jurisdictions.

† The number of graduate nurses is low because the survey did not include full-time personnel in health departments under a part-time health officer. The number of dental hygienists is low because this type of personnel was not asked for specifically on the survey questionnaire. The number of these two types of personnel in local health departments can be estimated from: Emerson, Haven. *Local Health Units for the Nation*. The Commonwealth Fund, New York, 1945.

The total figures for state and local health departments become:

	(1)	(2)	(3)	(4)	(5)
Graduate nurses	15,114	3,309	1,346	1,963	13
Dental hygienists	332	79	17	62	19

tists, 3,950 dental hygienists, and 490 health educators. These figures indicate the personnel to be reached eventually in an expanding training program.

Overall planning requires additional estimates of the number of students who may pursue public health training prior to employment in the field, normal replacements in existing positions, as well as the number who may be admitted to training after induction. Estimates of the probable training load for each of the major types of personnel will be essential as a basis for planning the necessary extension of the facilities of existing educational institutions, the possible need for new academic facilities, as well as the field and demonstration centers essential in an integrated system of formal study and field training. The Surgeon General's Committee on Post-war Training of Public Health Personnel estimates that the annual load of public health trainees requiring a full academic year in a school

of public health will be 600 to 1,000 for the next few years.

Both the preemployment and in-service phases of the training program should be planned with reference to the immediate and long-term prospects for employment of special categories of personnel. The war has intensified the demand for physicians, nurses, engineers, and chemists trained in public health work, for service in the field of industrial hygiene. The acute shortage of industrial hygiene personnel may be expected to continue in the immediate post-war period. Health educators represent another type of personnel for which the war emergency has increased the demand. The personnel inducted into such rapidly growing fields are relatively young compared with employees in the established field of general public health administration. It should be noted that present trends in medical care point to an increasing need for physicians with training in public

health, including administration, to serve as directors of school health programs, medical prepayment plans, hospitals, nonofficial health organizations and welfare agencies concerned with public medical care. Thus, aside from the health officers and other medical personnel who will be required in the continued expansion of our local health departments, the movement toward increased organization of medical services

is increasing the demand for physicians with basic training in public health. Finally, appraisal of the training requirements of public health personnel should be made to determine an economical allocation of the training load between the schools of public health and related departments of graduate schools, as well as the undergraduate departments of colleges, and the technical and vocational schools.

#### FEDERAL-STATE RELATIONS, AND OFFICIAL VERSUS NONOFFICIAL RESPONSIBILITIES

What rôle should be assumed by the Public Health Service in a comprehensive personnel training program? How should the state health departments be integrated in the training activities? What criteria shall determine an appropriate division of responsibility between the Service, for example, and the American Public Health Association? What are the areas in which the foundations and other nonofficial agencies can contribute most significantly? Such questions as these can be considered only briefly and tentatively here, but they suggest the nature of the numerous preliminary problems to be solved.

It may be assumed that the Public Health Service would provide technical and financial aid to the states in support of state and local training activities according to the general pattern developed under Title VI. However, the objectives of federal aid would not, as at present, be limited largely to the promotion of induction training, but would extend back to preemployment training, and forward, to in-service training. A central office in the Service under the administration of an Educational Director would have as one of its functions the provision of a consultant service to the states in matters relating to the training program of small jurisdictions. As a second function, the central office might cooperate with the

District offices of the Service in planning in-service training activities for state health department personnel. In addition to these cooperative services, the central office might serve as a screening center for the selection of trainees, and the direct recruitment of certain types of personnel, by conducting orientation courses and operating field orientation centers. Personnel research, the development of criteria for the approval of curricula and field training centers, and the coordination of statistics on personnel and training needs would be included among the general activities of the central office.

In addition to federal financial aid to trainees, in any extensive program it may be necessary to provide grants to schools of public health to enable them to expand facilities and personnel to take care of the increased load. The major financial responsibility for training public health personnel rests at present with the eight generally recognized schools of public health. The cost of training each student is at least \$1,000 over and above tuition. Thus the schools cannot increase the volume of their training program materially without outside aid. The interstate character of the services rendered by all schools of public health is a strong argument for spreading the cost. Since the maintenance of public health is a

responsibility of government, subsidies for such training may be considered a proper governmental responsibility.

Aside from the conduct of their own personnel training programs, the state health departments would assume responsibility for personnel training in the small local health agencies. Selected state health departments might be called upon to maintain field training centers to be utilized on a regional basis. With respect to organization, the large state health departments would require a personnel unit headed by an educational director. The Conference of State and Territorial Health Officers has already recommended that the states appoint a personnel director to coordinate veteran training and employment.

The long experience of the American Public Health Association in the field of professional education, combined with its position as the professional organization of workers in public health, suggest it as the appropriate agency to appraise the schools of public health and the curricula of other educational institutions training public health personnel. Such an appraisal would be followed by its recommendation of the various educational units for approval. The evaluation and approval of field training centers would represent another activity appropriate to this association.

An example of a proposed project supported by voluntary funds which will make a valuable contribution to education and personnel training is the

educational program for hospital administrators developed by the W. K. Kellogg Foundation. This project is of special interest in connection with the recent endorsement by the American Public Health Association of a national health program.

In conclusion, I should like to quote from the Association's official statement on this program, Recommendation VII b, as follows:

"State health departments should utilize those funds that may be available to train personnel in such technics as administration of health and medical services, and hospitals. Such a training program may contribute more than any other single activity to the future rôle of the official public health agency."<sup>9</sup>

#### REFERENCES

1. *Proceedings of the Forty-second Annual Conference of the United States Public Health Service with the State and Territorial Health Officers*, p. 76, March 21 and 23, 1944.
2. Meriam, Lewis. *Public Service and Special Training*. Chicago: University of Chicago Press, 1936, ch. IV, p. 64.
3. Reed, Lowell. The Role of the Schools of Public Health. Presented before the Conference of State and Territorial Health Officers, April 11, 1945.
4. McIver, Pearl. Census of Public Health Nurses. *Pub. Health Nurs.*, 36:498-501 (Oct.), 1944.
5. American Public Health Association and United States Public Health Service: *Employment Opportunities in Public Health*. New York: American Public Health Association, 1945, p. 6.
6. Palmer, George T. American Public Health Association. Personal communication.
7. Godfrey, E. S. Orientation and Complementary Training. Presented before the Conference of State and Territorial Health Officers, April 11, 1945.
8. Emerson, Haven. *Local Health Units for the Nation*. New York: Commonwealth Fund, 1945.
9. American Public Health Association: Medical Care in a National Health Program. *A.J.P.H.*, 34: 1256 (Dec.), 1944.

# The Health Officer and His Personnel

WILLIAM P. SHEPARD, M.D., F.A.P.H.A.

*Chairman, Committee on Professional Education, American Public Health Association; Third Vice-President, Metropolitan Life Insurance Company, San Francisco, Calif.*

IT has been my good fortune to number among my friends many health officers, particularly in the West. I am privileged to visit them on their own grounds and discuss the problems of public health which interest them most. We speak the same language and often hold the same viewpoints. Many of these friends are becoming big businessmen as compared with 20 years ago. In those days appropriations came from but one source, legislature, county commissioners, or city council. They were usually cut to the point where our problems, all but one, were simple. That problem was how to get the most urgent work done with our small staff. Otherwise, we had no worries about complicated accounting, multiplicity of reports and bureaus, punch cards and mechanical sorting, and such "frills" as merit systems, health education, industrial toxicology, and surveys. We had few personnel worries because we had such limited personnel. We hired and fired without let or hindrance from the Merit System; we trained the staff ourselves in the old-fashioned belief that public health was important enough to call forth a man's utmost efforts regardless of his schooling or rate of pay. Any physician who was eccentric enough to forsake the lucrative private practice of

medicine because he thought there were greater opportunities for service in public health, was a right minded fellow and did not need further formal schooling. We would show him the path of righteousness in Rosenau and the *American Journal of Public Health*, and by patience and persistence we would sometimes turn out a pretty good epidemiologist or assistant health officer.

But those days are gone, never to return. Public health is coming into its own. It receives much more of the public support which it deserves. Official health departments are becoming, in fact as well as in mind, a major function of government. None of us waste time longing for return of the old days. Public health is on the march and we are fully occupied with a rapid and fruitful advance. One of the problems we discuss most often these days is personnel, their selection and management.

Surgeon General Parran in his dedicatory address at the University of Michigan School of Public Health said, "The tripod upon which the public health structure of any country rests is: (1) A force of well trained personnel; (2) the appointment, promotion and retention of personnel on a merit basis; (3) adequate financial support, evidencing public understanding of the problems involved."<sup>1</sup> It is my contention that the third, adequate financial support, depends largely on the other

\* Delivered before the Forty-third Annual Conference of State and Territorial Health Officers with the U. S. Public Health Service, Washington, D. C., April 10, 1945.



two, well qualified and properly handled personnel. That is what I wish to discuss here.

Great advances are being made in personnel selection and management. These are new techniques as important to the public health administrator as new methods for the control of communicable diseases. We can no more run a modern health department with rule-of-thumb personnel policies than we can depend on the olfactory sense to diagnose diphtheria.

Few here would deny that public health is a specialty in which postgraduate training and practical experience are highly desirable. This applies not alone to the profession of medicine, but to nursing, engineering, dentistry, education, and all of the other professions from which career people in public health are recruited. While a physician or a nurse without special training has often done very well in public health in the past, nevertheless, and speaking generally, the individual with special training, already possessing the other attributes essential to success in this field, will do better and go farther than one similarly equipped but without special training. Certainly a young person seeking a professional career in public health today should be advised to obtain postgraduate education. That being the case, what kind of education is most desirable?

It has been our custom to recommend one of the well established schools of public health. Are they doing the job we need done?

In discussing these questions with health officers, there is rather general agreement that their personnel do benefit from courses taken at schools of public health and that they bring back much of value to the community, and the rest of the staff. They do, however, voice two main criticisms which are common enough to be ex-

pressed here and which seem to apply rather generally. We shall see presently that some of these criticisms arise from conditions which the schools alone cannot correct, and that the correction of some would be undesirable in long-term educational results. But by closer understanding of each other's problems we may all be able to work together on their solution.

The first objection expressed by health officers to the results produced by schools of public health merely indicates the age-old difference in viewpoint between "those who do and those who teach." It is that the student gets too much theory and not enough practical instruction. Specifically, there is too much bacteriology and laboratory exercise, too much detail in statistical method, too much philosophy and historical background.

The second objection expressed is that there is too little teaching of the things the health officer must do or know personally, such as: business administration (including correspondence, office management, personnel management, delegation of authority), political science and theory of government (including government and public health law), public speaking, health education, school health, and community organization. In addition, there is sometimes expressed a desire for more knowledge of the background and potential values of public health nursing, medical social work, and teaching.

These criticisms are supported by the fact that few health officers fail because they lack public health knowledge. There have been many examples of successful health officers whose public health knowledge was sketchy at best, but who were past masters at statesmanship. Failure, or at least lack of conspicuous success, is more often attributable to such things as lack of administrative knowledge, inability to understand people, failure to exert

community leadership, lack of knowledge of community organization. Perhaps these are qualities that cannot be taught, but I doubt it.

In defense of the schools it must be pointed out that they are primarily institutions of higher learning. They are not vocational or trade schools. There are so many good ways of accomplishing the same results in public health administration that the last thing the schools wish to do is to freeze the student's thinking. Their purpose is to encourage original thinking based on a sound knowledge of underlying philosophies. Only by such original thought can progress be made. The last thing the health officer would want is a recent graduate who was indoctrinated with the "one and only way" of doing things as taught at a given institution. He is likely to have his own pet "one and only" way, and will often expect the new appointee to accept it without question. The purpose of the schools, then, is to try to strike a happy medium between theory and application.

It is a fact, however, that teaching public health as a specialty is relatively new as compared with medicine, law, or engineering. It has grown in part by feeling its way. It is quite different from teaching medicine in which many indisputable facts must be mastered, then the application of these facts taught by the clinic method. There is general agreement that the practising physician's job is to heal the sick. In his case, job analysis is simple.

It is also a fact that some schools of public health have perhaps necessarily had to build their curricula by means of the professor's introspection; that is, how he did things and why. This method may suffice for a time but it is likely to lead to incompleteness, antiquation, and sometimes even distortion. Nevertheless, in general, the schools of public health have done well in developing and upholding the

science, discipline, and culture inherent in public health.

One method of keeping the teacher currently abreast of the changing demands upon his students is through occasional job analyses. In vocational schools the job analysis is the guide to the curriculum. This is because there is but one, or at most there are a few, best ways to lay brick, cut stone, operate a turret lathe. Not so with public health where there are an infinite number of good ways to preserve and improve community health. Furthermore, we are seldom assured that any of our present methods are the last word. Public health work is a profession, not a vocation. Its advance therefore depends upon minds with a rich cultural and scientific background combined with practical ability to devise and apply measures aimed toward realization of our ideals.

Nevertheless, job analysis may offer a useful adjunct and guide to curriculum construction in schools of public health. E. K. Strong has used this method of constructing curricula for plant executives and some engineers.<sup>2</sup> There is a well recognized technique for job analysis, which might be interesting and helpful to apply to the job of the health officer.<sup>3</sup> Briefly it consists of listing all the different things that the health officer actually does. When the list is complete it is broken down into related and similar functions, then the educator and the health officer try to agree on what types of training are needed to carry out these functions best. Does anyone know exactly what the health officer does, and what proportion of his time is spent on each duty? In my observation they spend a great deal of time on functions they never learned at school. Perhaps they are functions that cannot, or should not, be taught for fear of indoctrination. But it would be interesting to find out. Possibly the Public Health

Service could spare personnel to make a few analyses to see what they are worth.

There is an association of schools of public health which, I am sure, would be most receptive to any constructive suggestions that this group of health officers might wish to make. Deans of the individual schools are glad to hear from health officers who have helpful proposals designed to improve the school's methods.

One thing is certain and it concerns all who are interested in the training of our future health officers and other public health people. There is great danger of numerous and inferior schools of public health springing up in this country under the attractiveness of federal stipends through the U. S. Public Health Service and the Veterans Bureau. This possibility is increased by the attitude of some state fiscal agents who dislike to spend money outside their own state, even when it was federal money to start with. State health officers must do all in their power to break down this prejudice by pointing out that:

It is far better to have a few good schools than to have inferior ones in every state.

The volume of public health personnel applying for training in normal times will probably never justify as many schools of public health as there are medical schools; probably ten or twelve good ones would suffice.

The best of training is none too good for those who will be entrusted with preserving the health of the citizens of the state.

Such training is a complicated and expensive process requiring teaching personnel and facilities far beyond the resources of most states.

If this is not done, we are threatened with the situation of the Class B and C medical schools of a generation ago, and even with the diploma mills of two generations ago. This is a serious menace and it merits the most careful consideration of this body. It is already being studied by the Association of

Schools of Public Health and by the Committee on Professional Education of the American Public Health Association.

So much for the training of public health personnel to which this session is devoted, and for an important part of the first leg of Dr. Parran's tripod. When time permits, this group might profitably spend some time considering the best and most modern methods of selecting qualified personnel. The Committee on Professional Education feels that it has in its Merit System Unit a modern and helpful device for this purpose. More than 110 examinations of the most modern kind have already been given in 20 states, and demands for our services are increasing. These examinations are furnished states and cities at cost. They are proving far more trustworthy than anything we have had heretofore, since they test judgment as well as knowledge, and place less reliance on the glibness of the good talker and good writer. The method has been described in some detail by Atwater and Long.<sup>4</sup> Its importance to the health officer is pointed out by Burney and Hemphill.<sup>5</sup>

Once well trained personnel has been selected they are entitled to fair and modern treatment by their employer. Newer methods of personnel management may not be fully understood by those of us who were accustomed to hire and fire at will. They are important, however, as the second leg of the tripod and will merit careful study when time and occasion permit.

With your help, the post-war period can bring into public health careers the ablest and most promising recruits we have ever seen. Facilities for their training will be developed as needed. Such training will be along the lines that you suggest so long as your suggestions remain within the bounds of good science and good education. As more able young people are attracted

to our field, better results will be obtained and greater support will be forthcoming, and thus a benign cycle is completed by attracting still more able people to the field. Much depends on the way they are trained, selected, and supervised by their present employers.

## REFERENCES

- 1 Parran, T. Public Health Schools and the

Nation's Health, Dedicatory Address, The School of Public Health. *University of Michigan, Off. Pub.*, 46, 35 (Sept. 19), 1944.

2. Strong, E. K. Analyzing Industrial Educational Requirements. *C.I.T. Tech. J.*, Jan., 1921. Job Analysis of the Manager in Industry, School and Society, April 16, 1921.

3. Charters, W. W. *Curriculum Construction*. New York: Macmillan Co., 1923.

4. Atwater, R. M., and Long, L. D. Methods for the Selection of Public Health Personnel. *Canad. Pub. Health J.*, 36, 1 (Jan.), 1945.

5. Burney, L. E., and Hemphill, F. M. Merit System in Public Health. *A.J.P.H.*, 34, 11 (Nov.), 1944.

---

## Recognizing the Services of the Volunteer Nurse's Aide

Stella Goostray, Chairman of the National Nursing Council for war Service, New York City, has asked the Volunteer Nurse's Aide Committee of the American Red Cross to convey to every Nurse's Aide the thanks of the nursing profession for the war service so faithfully rendered. More than 207,000 women have been associated with this program through 1,313 Chapters of the Red Cross. Miss Goostray expressed the hope that, where nurse shortages still persist during the transition period, Nurse's Aides will continue their services.

According to Miss Goostray, the most important continuing service which the nursing profession asks of the Aide army is one in which all can play a

part, particularly those women who are free from the need to hold paid positions. Those who now know nursing and hospitals and public health services from the inside can be a vast power for creating the public opinion that can demand and obtain better health services.

Women who have served as Red Cross Nurse's Aides should prove invaluable members of community nursing councils, health councils, hospital boards, and public health nursing boards. As members of such groups, they can work with doctors, nurses, hospital administrators, and others to further the ultimate aim of nursing—which is a fuller and richer life for everyone through better health.

# Statistical Research in Clinical Tests for Nutritional Deficiencies

DOROTHY G. WIEHL, F.A.P.H.A.

*Milbank Memorial Fund, New York, N. Y.*

THE idea that malnutrition is a condition which is identifiable by means of some overall index or a few signs is no longer tenable. The manifestations of malnutrition are as numerous as the substances needed to support growth, maintain the life processes, and sustain the normal functioning of the organism. It has been shown that all tissues throughout life are in a dynamic state, that is, they are constantly being renewed, and a continuous supply of the substances used in any part of the whole life process must be available. A breakdown in the availability of any needed substance results in a disturbance or abnormality in the tissue which requires that substance directly or indirectly for its functioning or structure, that is, a nutritional disease is produced. Each nutritional disease is an entity with characteristic pathognomonic signs. Malnutrition, therefore, is indicated by the presence of one or a number of the various nutritional disturbances and diseases which may result from failure in the supply to meet fully the bodily requirements. As an inclusive term for a group of pathological conditions which arise from a deficiency of one or more of a very large number of nutrients, malnutrition has meaning, but the expression "prevalence of malnutrition" leads to confusion and dis-

agreement due to lack of clarity as to what is included.

The nature and extent of malnutrition in the population is a problem that must be studied in terms of the prevalence of specific deficiency diseases. For this, diagnostic methods for each deficiency are essential. The need of the animal body for more than thirty substances has been established on the demonstration that a lack of any one of them produces some definite ill effects. For most of the so-called major deficiencies in humans, only the signs or pathological manifestations associated with a severe or almost total deficiency have been well enough defined to be used as diagnostic criteria. Most students of nutrition are agreed that less severe deficiencies of needed nutrients produce lesions which are detrimental to health; and it is these lesions which arise from moderate or mild deficiencies which are believed to be extremely prevalent in the population. Thus we are concerned not merely with the diagnosis of each of many deficiency diseases but with tests or criteria to identify changes that are specific for various stages or gradations in the pathological process produced by a deficiency. Obviously, intensive study of lesions at various stages of deficiency is required for each nutrient. Progress is being made in identifying signs of deficiency states, but knowledge of manifestations at different stages is very unequally developed for different deficiencies.

\* Based on a paper presented at a Joint Session of the Vital Statistics and Food and Nutrition Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

Research on diagnostic methods is being conducted by many groups and is of different types. The tests may be classified broadly into four types, namely, biochemical tests of blood concentration, excretion tests, functional or biophysical tests, and clinical and morphological examinations including examination with x-ray and microscope. These tests disclose, respectively: (1) recent intake or availability through assimilation of given nutrients; (2) saturation of tissues; (3) ability of the affected bodily system to react or function normally; and (4) modification of tissues or anatomical changes, including hematological changes associated with anemia. Each type of test furnishes a different kind of information about the nutritive state. Blood and excretion levels fluctuate, rapidly for some substances and less rapidly for others which may be stored. Unsatisfactory levels give no information as to how long this state has prevailed, and satisfactory levels may be of recent origin. Functional tests, such as visual adaptation in the dark and resistance of capillary walls to pressure, have so far proved unsatisfactory as independent, specific, and reliable indices of a lowered nutritive state. Clinical and morphological methods reveal the cumulative effect of an inadequate supply of a nutrient on modifying bodily tissues which require the nutrient. It is apparent that findings from these four types of methods do not give interchangeable indices of a deficiency condition; nor do they necessarily bear a constant relationship one to the other. Furthermore, comparison of the relative prevalence of different nutritive deficiencies is unwarranted if different types of diagnostic methods have been used for the various deficiencies.

The mild and moderate forms of most nutritional diseases probably can best be identified and diagnosed by the lesions resulting from the cumulative

effects of a moderate and possibly intermittent deficiency. From studying the sequence of tissue changes in four avitaminoses (A, ascorbic acid, riboflavin, and niacin) Kruse,<sup>1</sup> in his article on "A Concept of the Deficiency States," has described certain general principles in the evolution of deficiency diseases, with special reference to the characteristics of early and mild deficiency states. This concept cannot be given in detail here, but the basic characteristics of the pathological changes involved in these deficiency states may be mentioned. First, it is stated that a specific deficiency invariably affects particular tissue sites and characteristic lesions appear. The pathological process develops at various rates, depending on the "causal force," that is, the degree of the deficiency and the rate of change from the previous levels. An abrupt or rapid change in intake produces a pathological process which is rapid in onset and in development. This is the acute form of the deficiency diseases and it may be severe or mild depending on the degree or intensity of the deficiency. A gradual, slow change from an optimum supply of the vitamin to an inadequate supply causes a process that is slow in onset and progresses slowly, becoming somewhat more accelerated as the intensity of the deficiency becomes more marked. This is the chronic process and it also varies from mild to severe according to intensity, and may be early or advanced according to the duration of the deficiency. The acute and chronic forms have characteristic lesions and each form progresses through various stages, from early to advanced. The rate of reversal of the lesion is governed by its rate of development, and the time required is related to the stage or degree of change. The severe acute form corresponds to the frank, clinical deficiency state and is diagnosed by gross examination. The mild acute and chronic

forms can best be diagnosed with the aid of the biomicroscope, although at advanced stages these forms also are macroscopic.

The deficiency states found in individuals in the general population are not distinct and separate as to form; that is, the acute and chronic forms occur in combinations of various stages of both forms. At a given time, only signs of a chronic process may be present, but frequently an acute process is superimposed on a mild or moderately severe chronic form. Both intake and requirements of an individual are subject to constant or frequent change with the result that the deficiency process also undergoes change and may shift from one form to another. Arrest or even reversal of lesions may occur on an optimum diet, but it now appears that seldom are chronic lesions completely cured unless appropriate therapy is instituted. This may be because it is rare for anyone consistently to have an optimum intake over a period sufficiently long to cure the slowly receding chronic lesion, or it may be that response is obtained only on therapeutic levels. The occurrence of these different forms, singly or in combination, at various stages makes necessary a system of classification of nutritional diseases in order adequately to describe and to compare the deficiency states found in different groups of the population.

The tissue sites selected by Dr. Kruse for detection of the four avitaminoses studied are: for vitamin A, the conjunctiva; for riboflavin, the cornea; for ascorbic acid, the gums; and for niacin, the tongue. He believes that lesions in these tissue sites are specific and early, if not the earliest, and that regardless of what other signs and symptoms may also have specific diagnostic value for these deficiencies, evidence of the deficiency will be found in these sites. These qualities of specificity, unailing occurrence, varying nature of the

lesions in accordance with severity and form of the deficiency state, and accessibility of the sites for examination make these diagnostic criteria especially useful for public health surveys and for studies of relationship of deficiency states to other diseases and symptomatic complaints, efficiency, fatigue, etc.

General acceptance of the diagnostic criteria outlined by Dr. Kruse for these four avitaminoses awaits further study and confirmation by independent research. In several studies, failure of a specific lesion to respond to therapy has been reported, and the specificity of some of the lesions for a particular deficiency has, therefore, been questioned. or, it has been suggested that some lesions may not be reversible. A detailed discussion of the evidence available for and against the validity of these clinical signs as diagnostic criteria cannot be given. Studies on human nutrition are necessarily complex and difficult to conduct under controlled conditions. Both internal and external environment introduce conditioning factors which cause variable results; and the well known difficulty of obtaining uniformity among examiners in appraising the condition of any tissue is always a potential source of disagreement. Perhaps of fundamental importance as affecting differences in therapeutic results now being reported is the differentiation of the acute and chronic forms of deficiency states, as proposed by Dr. Kruse, and the associated concept that the rate of reversal of lesions is a function of the rate of their development.

In research on pathological changes in tissues associated with specific deficiencies, statistical analysis has little to contribute. The statistician may be of assistance in some phases of a study, as for example, in selecting experimental and control subjects so that the groups are equalized in respect to relevant variables; or in directing atten-

tion to certain principles, such as the importance of a control group, and of maintaining identical conditions for it and the experimental group, and the need for independent, unbiased observations on control and experimental subjects. But major importance in this type of research attaches to careful observations and well defined criteria for classification of subjects with respect to their initial status and to changes in tissue, so that other workers can duplicate the observations, and subjects in different studies can be compared as to initial status and post-experimental status.

Progress in the problem of identifying lesions which are associated with a slight or moderate deficiency of a particular nutrient can be aided greatly by animal experiments. Intake levels, previous to and during the experimental period, can be controlled both for the nutrient being investigated and other dietary factors, and genetic and environmental factors can be equalized for control and experimental animals. Chronic changes can be studied in months in the rat that would take years in man. All tissues can be examined and changes described for various degrees and durations of deficiency. However, final proof of the manifestations of human deficiency states must come from studies on man.

In laboratory methods for appraising nutritional status, statistical methods may play a significant rôle, and one which has too often been neglected. Here, there is need to evaluate the accuracy of techniques. In laboratory procedures, opportunities for error are frequent. Errors arise in weighing and measuring chemicals and solutions, in reading a pipette or burette, in the manipulation of instruments, as for example, the handling and reading of a colorimeter, and from variation in chemicals used, and in their interaction in combination. Special data may have

to be collected to obtain observations made under conditions controlled for obtaining the independent observations needed for measurement of the different accidental and procedural errors. With a number of steps or variables in the laboratory procedure, some of which may operate independently and result in purely accidental errors, and some of which may introduce a systematic error, rather intricate statistical procedures may be required to identify the sources and magnitude of errors and to determine the net error of the final value. An understanding of the sources and types of errors will be useful in standardizing the use of a procedure so that the total net error will be a minimum. Knowledge of the magnitude of the net error is essential for accurate interpretation of the results.

Examples of analysis of a laboratory procedure in general use for appraising nutritional status can be found in two papers<sup>2,3</sup> in the series on Medical Evaluation of Nutritional Status from the coöperative study of high school students in New York City. These papers discuss errors in the photometric method of determining ascorbic acid in plasma on a macro sample and on a micro sample. The details of the analysis cannot be given in this brief discussion, but it is of interest that a preliminary analysis of the method before its general use in the survey resulted in some modification of the published procedure and in a standardized procedure for the survey which increased the reliability of individual plasma ascorbic acid determinations.

The importance of knowing the error to be expected in chemical and other determinations is sometimes overlooked. In the appraisal of nutritional status, individual values are classified in terms of the deviation from some "normal" or standard value or range of values. The degree of deviation from any postulated normal value which may be con-



sidered significant will depend on the error of an individual value. Furthermore, if the same biological value is determined by two methods of unequal accuracy for a group of persons, the findings from the less accurate method will have a greater dispersion, that is, there will be a larger number of extreme values, than the findings obtained by the more accurate method. For example, in the above mentioned papers on ascorbic acid determinations on macro and micro samples of plasma by the photometric method, it is shown that by the macromethod the determined ascorbic acid concentrations at 0.40 mg. per cent had 95 per cent confidence limits ( $\pm 2 \times$  standard deviation for experimental errors) of  $.40 \pm .08$ , or .32 to .48; but by the micromethod the 95 per cent confidence limits were  $.40 \pm .17$ , or .23 to .57. Similar or greater differences in reliability of determinations of ascorbic acid were found for all other levels. These values are, of course, for the procedure as used in the New York City survey of high school students. On the basis of these confidence limits, if one hundred children with plasma ascorbic acid levels of 0.40 mg. per cent were examined by both the macromethod and the micromethod, there would probably be only one reported value of 0.30 mg. or less in the macro series, but there would be about twelve such values in the micro series, and one of these might be 0.20 mg. or less. Thus, a comparison of prevalence in two groups of any biochemical value may give a misleading result unless it is known that values were determined with similar accuracy.

Precise comparability in the accuracy of the same procedure in different laboratories cannot be expected since the error is greatly influenced by the skill and care of technicians. Only by an analysis of the errors in its own laboratory can a research group properly interpret their findings. It is de-

sirable, in fact it is essential, that the errors in a procedure as used in any study or survey be reported so that the findings in different studies can be compared.

In the study of anemia, statistical methods have been applied to some extent, but the statistical aspects of the problems involved in establishing standards for diagnosis and classification of types of anemia have not been fully appreciated. Here too, statistical evaluation of the accuracy of specific methods is needed and the limits of the normal biological range for hemoglobin concentration, the number of red cells and the size of red cells should be more carefully studied. The clinicians' attitude has been to be content to diagnose only the severe cases of anemia in which the hemoglobin level is subnormal by any method or any standard. For the detection of cases of moderate hemoglobin deficiency, better standards for normal values must be available and accuracy of determinations should be known.

The present unsatisfactory status of our knowledge of average hemoglobin levels which are the basis for so-called normal levels may be illustrated by mentioning the findings from a number of surveys. For adult males, mean hemoglobin values reported have varied from 12.22 gm. per 100 ml. for an urban group in Pennsylvania<sup>4</sup> to 17.00 gm. for a group in New Orleans.<sup>5</sup> Average values for men in the majority of surveys have been between 14.5 and 16.0 gm. without any clearly evident central or modal average value. For 2,095 males in the New York Metropolitan area, an average hemoglobin level of 14.6 gm. was reported<sup>6</sup> but in our studies of New York groups, for 79 WPA workers the average hemoglobin level was 15.36 gm. and for 120 boys 18-19 years of age the average was 15.30 gm. In a recent survey of 1,170 aircraft employees in Burbank, Calif.<sup>7</sup>

the average hemoglobin level was 14.61 gm. and Osgood<sup>8</sup> has reported an average value of 15.8 gm. for adult males in Portland, Ore. Although a variety of methods differing in accuracy have been used in these surveys, the wide range in means must reflect either systematic differences in the methods or real differences in the populations surveyed or a combination of both. The data cannot be interpreted, but it is very probable that procedural differences account for much of the variation in group means.

Careful study of the sources of procedural differences which cause such marked systematic differences in hemoglobin determinations by different investigators obviously is needed. It is not entirely a statistical problem, but the coöperation of statisticians with technicians on problems of calibration and sources of differences might result in better standardization of methods or at least in some method for equalizing or comparing results of different procedures.

Implicit in the problem of detecting mild and subacute conditions, whether by biochemical tests or by clinical signs, is the need for well defined standards for the normal or healthy state. So long as a deficiency disease was diagnosed on signs and symptoms associated with obvious disease, disability, or disfunction, a normal condition was assumed in the absence of such evidence. On this basis, the normal state of tissues and other physiological conditions showed considerable variation from person to person and these variations were not considered as having significant health implications. Now that research is showing that certain supposedly normal variations are produced by inadequate supplies of various nutrients, and can be modified by supplying greater amounts of the nutrients, the criteria for the normal state are being changed. However, since these bodily

conditions which can be shown to have a nutritional cause are very prevalent among apparently healthy persons, their ill effects must be determined. Little evidence from human studies is available and intensive studies are needed to demonstrate what are the deleterious effects of mild deficiencies and what benefits or improvements in health are experienced from optimal nutrition.

In investigations on the relationship between nutritional status and health or between nutritional status and other factors such as physical efficiency, learning ability, etc., there will be opportunity and actual need for the advice and assistance of statisticians in planning experiments, in analysis and interpretation of results. Essentially these will be studies in which differences are to be measured and evaluated, and this is a statistical procedure. The statistician should have a part in making the plan, in determining what variables are to be controlled or measured and how, and in deciding methods for measuring or classifying the criteria by which effects are to be judged.

The potential field of study on effects of lowered nutritional status is very broad. In respect to health, the possible relationships are many and there is little evidence to indicate what signs of ill-health are most closely associated with deficiency states. Specific deficiencies may increase susceptibility to specific diseases or contribute to the development of degenerative diseases at an earlier age. Many of the so-called minor complaints and symptoms, such as digestive upsets, headaches, and nervousness may be caused by nutritional disturbances. Absence of disease and specific symptoms are not entirely satisfactory criteria for health. Dr. Ryle of Oxford, writing in *The Lancet*<sup>9</sup> on "positive health," said "The healthy man is the 'whole man,' whole in functional regard, in the enjoyment of his faculties and well

adapted to his environment." Can these qualities of the healthy man be measured and the effects on them of nutritional inadequacies be evaluated? Other characteristics suggested as related to nutritional status include efficiency, physical performance of various types, endurance, and learning ability. Clearly, the unfavorable effects of lowered nutritional status may be manifested in a variety of ways. Furthermore, these effects may be operative or apparent only if the subject is exposed to the effects of certain conditioning factors, such as infections or toxic materials, physical strain or severe exercise, growth, pregnancy, climatic factors. Properly controlled studies on human subjects will necessarily be difficult to conduct, and results are more likely to be expressed in significant tendencies or group differences than in evidence of uniform or consistent effects for all individuals. Studies in the past have been handicapped by the lack of valid criteria for classifying the nutritional status of subjects under experimental observation. With suitable diagnostic tests for the major de-

ficiencies, studies of the relationship of nutritional deficiency to health and other attributes may be conducted under conditions which are more satisfactory and more likely to yield definite results.

#### REFERENCES

1. Kruse, H. D. A Concept of the Deficiency States. *Milbank Memo. Fund Quart.*, 20, 3:245 (July), 1942.
2. Wiehl, D. G., and Kantorovitz, Myron. Medical Evaluation of Nutritional Status, XI. An Analysis of Sources of Errors in the Photometric Macromethod of Determining Ascorbic Acid in Plasma. *Milbank Mem. Fund Quart.*, 20, 2:178 (Apr.), 1942.
3. Beebe, Gilbert W. Medical Evaluation of Nutritional Status, XIII. The Experimental Error of Determinations of Ascorbic Acid in Plasma by Micro-method of Mindlin and Butler. *Milbank Mem. Fund Quart.*, 20, 4:389 (Oct.), 1942.
4. Mack, Pauline Beery, et al. Hemoglobin Values in Pennsylvania Mass Studies in Human Nutrition. *Milbank Mem. Fund Quart.*, 19, 3:282 (July), 1941.
5. Wintrobe, M. M. Hemoglobin Standards in Normal Men. *Proc. Soc. Exper. Biol. & Med.*, 26: 848, 1928-1929.
6. Leslie, Charles J. Notes on Hemoglobin Values. *Proc. Life Extension Examiners*, II, 5:105 (Sept.-Oct.), 1940.
7. Borsook, Henry. Alpert, Elmer, and Keighley, G. L. Nutritional Status of Aircraft Workers in Southern California, II. Clinical and Laboratory Findings. *Milbank Mem.-Fund Quart.*, 21, 2:115 (Apr.), 1943.
8. Osgood, Edwin E. *A Textbook of Laboratory Diagnosis*. 3rd Ed., 1940, p. 172.
9. Ryle, John A. Education for Health. *The Lancet*, I, xviii:713 (June 3), 1914.

---

## X-Ray in Health Week

The 50th anniversary of the discovery of x-rays will be the basis of a nationwide educational program during the week of November 5 to 10 to familiarize the public with the importance of radiology in everyday health, Dr. Lewis G. Allen, Chairman of the Commission on Public Relations of the American

College of Radiology, has announced. He pointed out that despite the widespread use of x-rays by the medical profession, large sections of the public are completely ignorant of the invaluable aid radiology has been in the prevention, diagnosis and treatment of disease.

# Health Education in Hospitals and Outpatient Departments\*

HENRIETTE STRAUSS

*Department of Preventive Medicine, The Johns Hopkins Medical School,  
Baltimore, Md.†*

FOUR years ago the walls of the Johns Hopkins Hospital in Baltimore became a tool for health education. Begun as a volunteer project under the sponsorship of the Food Clinic, the experiment described here was taken over by the Department of Preventive Medicine in the summer of 1941.

The experiment shows in miniature what potentialities for health advice and instruction lie in the untold miles of bare walls and corridors to be found throughout the country in our outpatient departments and hospitals. It attempts to remedy a situation familiar to all who have worked in clinics. Patients in our dispensaries sometimes wait hours before they receive treatment. And we have let them sit, with nothing to distract them from a deepening preoccupation with themselves, nothing to stimulate their interest in the possible causes of their illness, the prevention of future trouble—except others around them equally anxious, equally uninformed. Anxiety mounts as they wait. They are in the mood to appreciate sound health advice. Yet in centers that contain for the layman everything authoritative in the field of health information, we permit these large audiences to go untaught.

## THE BEGINNING: A VOLUNTEER PROJECT, SPONSORED BY A SINGLE CLINIC

In its own quarters in the Outpatient Department of the Johns Hopkins Hospital, the Food Clinic for a long time has practised its belief in the quick teaching value of exhibits and circulated good available commercial leaflets, as well as material of its own making, among its patients. In the fall of 1940 it sponsored the initial exhibits of this experiment—the Vitamin Series—six by five foot billboards, using raised lettering, carefully thought out for color and design as well as statement. The boards were hung in a main corridor of the Outpatient Department, one each week, behind a demonstration table which displayed the listed foods containing the specified vitamin. Taking advantage of the interest with which any information about vitamins was received in those days, the boards sought to sell the idea that vitamins come in food as well as pills—and much more cheaply. The splash of bright color in the gloom of the dispensary and the pertinent information drew groups of people to the tables and caused considerable comment, which did not go unnoticed by the hospital staff.

Several months before the National Nutrition Conference spearheaded the drive for what the whole country recognizes now as "The Basic 7," a bookcase display was set up, on whose

\*Based on a paper presented before the Public Health Education Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

†Now with E. R. Squibb & Sons, New York, N. Y.

shelves wax models demonstrated the five basic food groups from which servings should be chosen every day. Upon request, it was made portable for use in other parts of the hospital. Also upon request, it became a permanent exhibit, hung beside the information desk. Daily, for nearly four years, its racks have been refilled with the latest leaflets on food, and on ways to cook and conserve it.

#### EDUCATION OF THE STAFF IN A NEW TEACHING MEDIUM

One of the immediate problems facing this particular teaching medium was to break down people's conception of it as solely a way to put across food information. Food demonstrations and posters are not new. The "year of preparedness" saw a tremendous increase in poster material for use by lay groups. Food exhibits have long had a respected place in the Boston Dispensary. But the use of this medium to teach other aspects of preventive medicine was another matter. Therefore mute instruction of the staff in the use of this tool was begun. An exhibit on baby clothing appeared in the Harriet Lane Dispensary, sponsored by the Harriet Lane Social Service Department and the Visiting Nurse Service. Beaverboard cutouts of babies were dressed in the actual clothing that comprises the layette and gazed out on the benches in Prenatal Clinic from a six by five foot board, that carried a minimum of text. The giant red and black cutout figures that illustrated the first co-operative venture with Orthopedic Clinic scared a number of people when they came around the corner too fast, and taught us some of the "don'ts" in presentation technique, but it carried on this education with its listing of common complaints under the heading, "Is One of These You? Aches and Pains Can Come from Bad Posture."

Healthy Hebe, namesake of the

Greek goddess who kept the Olympic deities eternally young on a diet of nectar and ambrosia, appeared early on a wall outside the dining rooms of the nursing staff. Pert and decided in her notions, her tri-weekly "Healthy Hebe Says . . ." not only brought to their attention simple health situations and the demands of the civilian war effort, but also a pictorial way of teaching which they could apply to their own purposes. Only as the staff becomes better trained, however, in recognizing the place of health teaching in the clinics, will any program of health teaching aids be successful.

In an encouragingly short time exhibits found their way into the classroom. A four by five foot exhibit telescoped an hour's discussion for student nurses on the preparation of and equipment needed for the Baby Formula. It was put on wheels so that the nurses could roll it in the wards when giving the same talk to the home-going mothers in Woman's Clinic. It was planned so that it could be easily taken apart and transported by auto if borrowed by a city clinic. A sign below it said, "Every item on this exhibit was bought in the 5 and 10," for that was in 1940. It followed a policy we still pursue, that instruction be of equal value for all levels of our audience, but no demands be made that could not be met by people with restricted budgets.

#### THE FUTURE HEALTH EDUCATION PROGRAM WILL BE INTEGRATED, INTER-CLINIC

It became evident that two dispensary programs could be evolved out of the proper use of this medium of visual education, one fitting inside the other. Each clinic in the Outpatient Department had important preventive knowledge to contribute to the Outpatient Department as a whole. A visual lecture on foods that help the teeth hung in Dental Clinic; knowl-

edge of the use of the x-ray, "Spot TB before It Spots You," found receptive audiences elsewhere than Chest Clinic. Such pooled information can not only clarify the work of the clinics, but at the same time offers the patient needed insight into the healthy functioning of his body as a whole. Special teaching problems within the clinics themselves required a type of poster that met specific situations and needs of interest only to a small clinic group. One such poster was our "poker hand," illustrating on each tremendous card a rule of particular importance to the diabetic—"Diabetic? Do You Hold This Winning Hand?"

One November day the following went up in different parts of the Outpatient Departments:

"Don't Spread a Cold"

(simple rules for protecting others—a 4'x5' copy of an 8"x6" poster of the National Tuberculosis Assn.)

"At the First Sign of a Cold . . ."

(proper use of nosedrops to block the spread of infection to sinuses and ears)

"Don't Be a Cold Gremlin"

(absenteeism due to lack of protection of self and others)

"Block Every Kerchooooo! Help Check Grippe and Flu."

Patients going from one clinic to another had one point brought home to them in various ways, and the repetition served to break painlessly through preoccupation. With proper personnel and greater organization, one can see as an outgrowth of this attempt at co-ordination an outpatient program so organized that when the season of the year or local health problems demand a drive, the material on all the walls will strike home a single message from a number of different angles.

#### "TECHNICAL" CONSIDERATIONS AND THE GROWTH OF A LENDING LIBRARY

A "calendar" of displays became necessary which now, over the four year

period, shows an impressive rotation of exhibits throughout the Outpatient Department. There have been as many as thirty-two exhibits up at one time, and we kept to the rule that no display should remain in one place longer than a month. Pertinent leaflet material should go with each one, but lack of quality and quantity, as well as lack of personnel, has kept this too much of a theory.

The paint and equipment needed to construct the three-dimensional poster cost startlingly little: cold water paint in quart and gallon cans, a few brushes, beaverboard, and homazote for both backgrounds and letters, bits of material, pipe cleaners to make figures for dioramas, hammer, screw driver, coping saw, and, after awhile, an electric jig-saw. The carpentry for most of the exhibits, from the beginning, was done with the help of Henry Phipps Psychiatric Clinic's carpenter shop. We know from continuous experience that patients have gained a great deal of satisfaction from feeling they might be helping other patients.

Two complaints against exhibits have been that they are expensive and they take up room. The materials and the technique used disproved the first complaint. The making of a blueprint, so that dismantled exhibits could be resurrected in a couple of hours, as well as reproduced in any quantity desired, opened up new possibilities for a lending library that could grow with each new exhibit made and become of use to the community. When "boxed," ten exhibits can fit on one small shelf.

It became necessary to think of exhibits in terms of their portability. When a defense plant and a school asked us in the same day if we could make Hebe posters for them, and requests for material began to come in from the community and from organizations in other states, we became aware that our program could serve a far wider audi-

ence than our hospital one. A traveling exhibit made for the Maryland State Department of Health was designed to travel as easily as a very light suitcase, so that a field worker would not leave it behind "accidentally on purpose" because of its awkwardness in handling and setting up. Frames, into which beaver board could easily slide, were designed with interchangeable units, that could be sent by mail cheaply, without being crated or damaged. Miniatures appeared: "How Do You Eat?" a variant of the "Basic 7"; and "Baby Eats to Grow," which showed the mother when and how baby's diet is expanded. Called "bench" or "bedside" exhibits, their extreme lightness and smallness allow them to be used for individual instruction by the nurse, social worker, or nutritionist, when talking to a patient waiting on a bench in one of the clinics or lying in bed on one of the wards.

Aside from the blueprint, we stumbled upon the fact that exact copies of our displays could be made by enlarging the scale of our photographs, as was done with "Regular Hours for Baby" (El Reloj Que Marca La Salud De Su Bebe) in Bogota, Colombia. When our photograph album was microfilmed by the Office of the Coordinator of Inter-American Affairs, a large group gained access to these ideas.

#### TEACHING MEDIA CAN BE MANY AND VARIED

We have used demonstrations, exhibits, dioramas (in our "allay panic" series on civilian defense), posters, leaflets, photographs (for example, the British Information Services' series on Penicillin). The radio and the record in our present setup are impracticable, though publicizing the community's radio health dramas is something else we can do. The most important visual medium of all, the teaching film, needs facilities for

which hospitals and clinics have not yet arranged, and there are no places that I know of where patients can see movies while they wait. Some day, perhaps sooner than we think, television will be utilized. We did buy an automatic slide projector and set it in a mobile stand that would allow it to project pictures onto the portable screen at a height to let seated people watch the slides undisturbed by passersby. Only a few pertinent filmstrips were found that could be converted into slides, so we made one experimental series of Kodachrome slides ourselves, "Eating Is What You Make It," with the help of material lent us by the *Woman's Home Companion*. Due to the lack of material and lack of personnel, we have used this machine only to prove its possibilities instead of as a natural part of our work. Its advantages are that it holds forty-eight slides, works automatically and simply, and can be used in a small area without drawing shades or putting out lights. It has been tried on the wards of Woman's Clinic as well as in the dispensary to see if its movie qualities would attract the convalescing ward patients. It did.

#### AN EXPLANATORY EXHIBIT CAN REASSURE AND PROMOTE A MORE COÖPERATIVE ATTITUDE

The whole idea of exhibits for use on the wards is provocative. Patients often do not understand that the tests they are given are ward routine and not a sign of new complications to their illness. And a busy staff cannot always stop to explain, even if it senses the need. An explanatory exhibit of the blood count, for example, contains strong elements of mental hygiene to recommend its use here. This need for reassurance and clarification of unfamiliar procedure finds a like need where registration takes place. Having to wait, and not knowing why the wait

is so long causes anxiety. People believe they have been forgotten, or hopelessly entangled in red tape. No layman understands why, when he comes to a hospital in the emergency of sickness, he is not rushed to treatment immediately. We set up a large three-dimensional poster in front of registrants, which says in large type, "Thanks for Waiting. Registration Takes Time." It explains pictorially the rather devious route by which a registrant finally arrives in a specific clinic. We tried at least to show him what causes delay, and introduced him to a new idea, the administrative problems of the clinic. We expect preoccupation in our audience. We are used to apathetic people. But we know also that they grow antagonistic if they have waited long enough. These billboards can serve as silent salesmen of good will as well as health, and the staff may find a more coöperative, confiding group of patients.

#### RÔLE OF THE HOSPITAL AS A HEALTH EDUCATOR EXPANDS

New responsibilities developed. We wanted to present more concrete help to our audience, and the general health rules became more specific. Instead of "exercise some every day," we asked the Department of Public Recreation to give us material for "Fun Near Home," a recreational map of Baltimore, made vivid with easily recognized symbols. Food demonstrations shared interest with "Blame the Rat, Carrier of Disease," "Meet Toxoid, the Life-saver," "Is Life Tearing You to Pieces? Learn Why and Get into the Driver's Seat" (in co-sponsorship with the Henry Phipps Psychiatric Clinic), "Get Rid of the House Fly. He walks where diseases breed and gives the germs a free ride to your food . . ." (in co-sponsorship with the Department of Parasitology). We began a file of the available health education ma-

terial in the country, so that when people asked us for help, we could direct them to the agencies, commercial and otherwise, that were printing, painting, filming health information. The great need for a clearing house, a selector of some sort, to bring order out of chaos, was brought home to us. The need for more people equipped to utilize and distribute this available material is obvious, too. We have material. We have an interested audience. Who are going to act as the middle men? We believe that as this branch of health education expands and takes on order, there will commence a healthy swapping around the country of the material worked out so carefully by specialized groups, and that a department such as ours can act as one of the middle men.

A class, as part of the course in "The Social Aspects of Nursing," was begun a year ago last February for student nurses who were working in the Out-patient Department. One of the tools of health teaching stressed in this course is the potent one of friendly conversation. Both the use and abuse of visual aids were discussed. The use of posters and leaflets to highlight problems found in the dispensary gave concreteness to the discussion as well as showed how sparse still is the material with which we can work.

#### CONCLUSION

By trial and error we learned about our audience. We were encouraged by their interest and appreciation. We also found out something of how shy they are, and uncertain about their right to ask questions and to move freely about. We learned from our patient-participation exhibits that people are reluctant to do things in front of other people, like pulling open a door to face a mirror, in "Who's Responsible for Your Health?"—so care should be taken in how they are used. The same



shyness demands that an exhibit, to give a true story to everyone, should say as completely as possible what its point is in letters large enough to reach back into the waiting room.

In conclusion, certain things must be pointed out. The idea is still an experiment, not a policy. Indulgence, rather than active participation, is still the more usual attitude. Many of the staff do not recognize that the hospital has added to its responsibility for curing its patients a new one, one that can affect the whole community, that of

teaching its patients how to prevent and control illness. No means for evaluating the work has been created yet, and as the program develops, some way must be found by which its effectiveness can be measured and improved. Difficult working conditions, frequent changes in personnel, and limitation of materials have added to the pioneering aspect of the work. However, the experiment has continued under growing encouragement and understanding. It appears to possess an inherent vitality which promises well for the future.

---

## Retirement Association

The National Health and Welfare Retirement Association, New York City, went into operation October 1, covering the first 5,000 health and welfare workers to enroll. According to Gerard Swope, Chairman of the Board, workers in more than 75 cities are included in the first 5,000. The purpose of the Retirement Association is to help workers in health and welfare agencies who are not

now included under Federal Social Security to provide income after retirement age on a contributory basis. Among the types of organizations whose employees are protected by this plan are hospitals, nursing organizations, orphanages, family welfare societies, homes for aged, recreation associations, Girl Scouts, traveler's aid societies, legal aid societies, and tuberculosis societies.

# Health Education Methods of the Red Cross

H. E. KLEINSCHMIDT, M.D., F.A.P.H.A.

*Medical Director, North Atlantic Area, American Red Cross, New York, N. Y.*

SINCE the war began, the Red Cross has given first aid certificates to 6,839,000 people. Home nursing certificates have gone to 1,192,000 homemakers (both men and women) as well as school and college students. Another 455,000 persons finished a 20 hour course in nutrition, and some 141,000 were trained to serve as nurse's aides.<sup>†</sup>

These samples reflect, but do not fully picture, the magnitude and scope of the health education activities of the American Red Cross. If I presume to outline some of the methods employed, I do so as an interested bystander, only indirectly connected with these services.

The war, of course, stimulated the rapid expansion of Red Cross educational work, but the basic pattern for it had been worked out quietly and patiently over a period of some 35 years.

The courses in first aid, water safety, nutrition, and other subjects, all follow this pattern, but for purposes of illustration I shall comment particularly on the home nursing course, because it was the pathfinder and because this particular course is of most significance to the public health worker.

The home nursing course is designed to train the homemaker in simple

methods of caring for the sick and in safeguarding the health of the family. It does not qualify one to perform a public service; it is not a substitute for medical or nursing care. In short, home nursing is a special homemaking skill. It includes not only skill in emergency care of the sick at home, but also skill in maintaining a healthful household. The home nurse is the monitor of health in the home. Since there is hardly a public health problem which does not reach into the home, the value of training annually some half million persons in home nursing in as many American homes can hardly be overestimated, for each of these monitors has at least learned the fundamentals of health protection, and each will be responsive to the leadership and sensitive to the suggestions of the health officer. Home nursing is the essence of public health applied to the individual in his daily living. The course is elastic. The emphasis may easily be shifted from one subject to another, according to the needs of the day and the geographic locality or to pressing current health problems.

The historical background of home nursing throws light on its present status. In 1908, Mabel Boardman—one of the first members of the Central Committee—enlisted the aid of several nurses in the District of Columbia to give a series of lectures and demonstrations to the women of Washington on Hygiene of the Sickroom, Dietetics,

\* Based on a paper presented before the Public Health Education Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

† The figures in this paragraph are for the period of January 1, 1942, to July 1, 1944.

Tuberculosis, Contagious Disease, Mother and Baby Care, and Medical and Surgical Emergencies. These lectures were popular at once, but drew the criticism of those who feared such training might lower nursing standards. With this in mind, leaders in nursing were asked to outline a course which could safely be given to women for home use. Jane A. Delano, first director of the Red Cross Nursing Service, saw the possibilities of the course and planned a textbook which appeared in 1913 as *Elementary Hygiene and Home Care of the Sick*. Red Cross chapters all over the country promoted the course, and the number of classes grew so rapidly that many chapters found it necessary to set up "teaching centers."

The first World War gave added impetus to the enterprise. As the demand for classes spread in ever-widening circles, the need of training persons to teach the course came into sharp focus. Personal, centralized control was no longer possible, and this led to the preparation of the teacher's manual, *Guide for Instructors of Classes in Home Hygiene and Care of the Sick*, first published in 1920.

Twelve years of post-war lethargy followed, with a decided drop in the number of home nursing classes. Then, in 1933, home hygiene joined the march with the adult education movement. The Red Cross, with its ready-made channels for reaching large numbers of people and with a study outline that had stood the test of time, coöperated with other agencies, particularly those supported by federal funds, and soon great numbers of people, struggling with unemployment problems, welcomed the opportunity of attending classes in home hygiene. In 1933-1940, 61,885 certificates were issued to those who had completed the course.

Again, in 1940, the war suddenly accelerated the demand for training in home hygiene—the old course was

streamlined and given a new name: "Red Cross Home Nursing."

This brief recital brings out the basic design of the course, the elements of which are:

1. *Discovery of the need for a certain body of knowledge and the groups who need it.* In 1908, when visiting nurses were still charting unknown seas, it was becoming apparent that an important function of the nurse is to teach. Homes stalked by sickness were handicapped usually, not only by poverty but also by lack of knowledge and by ineptness. Mothers had to be taught the most elementary technics of caring for the baby, of quarantine practice, of feeding the family. The trail had been blazed by Sir William Osler, who introduced the practice of sending a young woman medical student to the homes of his tuberculosis patients to help them carry out the doctor's orders. But the discovery that housewives generally are in need of knowledge about health was a notable one—and it led to the next step, namely:

2. *The selection of the subject matter.* To cull out of the vast body of medical knowledge those fundamental principles which are pertinent to the needs of the layman requires mature judgment. No greater challenge confronts the health educator than that of determining what to teach and what to omit. What must a mother know in order to distinguish between health and sickness? What are the essential facts she should know about nutrition? What nursing technics may she safely practice? The temptation of the enthusiastic teacher is to share with her students the detailed knowledge which fascinates her, and only by rigid discipline is she able to select that which is of pragmatical value. By the trial and error method, Miss Boardman and her successors have threshed the grain, but the process of refining and revising subject matter still goes on.

3. *The Home Nursing Textbook* is written in simple language which avoids the use of technical terms as much as possible. Repeated revisions have not yet made it flawless, but it is generally sound. After the course is finished, the textbook remains in the home. The health worker who values the power of the printed word and understands the difficulty of distributing it wisely, will acknowledge that the placement of a half million books in as many American homes during one year is, of itself, a mighty accomplishment.

4. *The preparation of qualified teachers.* The great demand for instruction in home nursing and the shortage of well prepared nurses have made it difficult to maintain the high quality of teaching which the Red Cross desires. Only persons who meet certain standards of academic and professional education are authorized to teach. If the instructor is a volunteer, she must be a graduate of a recognized school of nursing and registered in at least one state, and if she has had experience in teaching, so much the better. Paid instructors should, whenever possible, have completed a year's study, or its equivalent, in public health nursing in a university program approved by the National Organization for Public Health Nursing. In communities where there are several instructors, their work is usually supervised by a director of Red Cross Nursing, who meets rigid standards of training and experience. In short, instruction in home nursing is given by persons who are recruited, trained, and directed with meticulous care.

5. *The organization of classes* is the responsibility of chapters, of which there are now 3,756 in the United States. Back of that job is the incessant and demanding task of promotion. Classes do not crystallize out of the void. To persuade people to enroll calls for public skill and resourcefulness. Find-

ing candidates to undertake the teaching job is a year-round activity. Arranging suitable hours, finding a place in which to assemble classes, providing the equipment, and keeping all on schedule is no mean administrative task.

6. *The teaching is done primarily by actual practice.* Students learn to do by doing. Each technic is demonstrated by the instructor; then the student is expected to "give it back." Naturally, the classroom is equipped with the necessary articles and supplies, such as bed, blankets, hot-water bottle, thermometer, etc. Whenever practicable, improvised equipment is used, and students are encouraged to use initiative in devising their own substitutes for sick room necessities and comforts. A certain amount of didactic instruction is, of course, also given, and teaching aids, such as charts and movies, help to supplement the lessons.

The present war emphasized the need for a short course. Because of the decrease in doctors and nurses available for civilians, a course titled "Six Lessons in Care of the Sick," streamlining basic nursing procedures, was developed for groups too busy or hard to reach to make the standard (24 hour) course practical. In this course one method only is taught for each technical situation. There may be many ways of making a bed, but you may be sure that if you are cared for by a home nursing student in Maine, your bed will be made comfortable in precisely the same way as it would be in California. Standardization of teaching material admittedly has its disadvantages—it is inelastic and not conducive to student exploration, but that is outweighed by the necessity of avoiding confusion in the mind of the student, for technical training is, of necessity, authoritarian. There is free scope for group discussion, however, and for independent thinking when the subject concerns general principles of health conservation.

7. *Students are given a certificate when they have completed the course.* The Red Cross has learned from experience that successful learning effort must be rewarded or, at least, recognized. The certificate awarded to the home nursing student is highly prized by the winner, even though it does not entitle her to wear a uniform. The certificate does entitle her to wear a Red Cross home nursing pinafore (cover-all apron) and a Red Cross home nursing pin. She may volunteer to serve recognized community agencies if her interest in service extends beyond the limits of her own home. Home nursing volunteers are giving assistance in such services as public health nursing agencies, clinics, hospitals, and blood donor centers.

The hope of winning a certificate is an incentive to faithful study, but perhaps not strong enough to attract many people. Therefore, other incentives are needed to supplement the desire for a certificate—incentives which, in my estimation, are more substantial. Among them, I should place highest in the list the promise of acquiring skill. Pride in one's job is a powerful motive. Running a household, sick or well, is drudgery unless one enjoys the satisfaction of doing it well. What woman's bosom does not swell with pride when she is called by a neighbor to assist in a task for which she has a knack—whether it be to flavor the apple butter, hem a skirt, or give the baby an enema. The satisfaction of knowing how to take temperature, how to make a bassinet, how to make a bed with a patient in it is, perhaps, the best reward offered the home nursing student.

Such is the overall design of the health education methods of the Red Cross. It might, with variations, be just as well illustrated by other ex-

amples, such as the courses in first aid, nutrition, or accident prevention, all of which prepare the student for "service" to others and, at the same time, help him to meet his own health needs. The home nursing course has the added advantage—potentially, at least—of making "every home a health center," responsive to health and medical leadership. The training given is not haphazard, but carefully conceived, systematically applied, and wisely administered.

For many problems of public health, perhaps, these methods are not applicable. Red Cross courses deal with subjects that are more or less concrete, delimited, tangible. Many health educators, however, have the more difficult task of arousing interest in subjects which, to the public, seem abstract or theoretical. It would certainly be impracticable to depend upon formal courses of study to cover all aspects of public health. Moreover, there are many people who cannot be persuaded to take courses of any kind. Yet one wonders if health educators might not be more ingenious in applying the educational principles that do work, to such problems as the prevention of diphtheria, tuberculosis, syphilis, the conservation of eyesight, the rehabilitation of the handicapped, and the promotion of good public health practice generally.

Certainly the time has passed for the kind of shotgun publicity which blazes forth without definite aim and in the hope that here and there a shot will find its mark. The pamphlet, the newspaper article, the movie, and the radio have their functions, but these—alone or in combination—might well be supplemented by the more intensive form of education in which the student participates and which demands his best effort.

# Utilizing Medical Social Service in a Venereal Disease Clinic

MARGARET LUMPKIN

*Venereal Disease Control Service, Health Division, Department of Public Welfare, City of St. Louis, Mo.*

ON April 15, 1943, a medical social worker was placed in the Medico-Legal Clinic of the St. Louis Venereal Disease Control Service, for an experimental period of one year, to study the case work needs of young girls who were brought to the clinic for examination and for treatment of venereal disease. The medical social worker was to interview selected patients, determine their needs, evaluate their capacity for redirection, and refer them to appropriate social agencies for continuing service.

This was a demonstration project sponsored by the Social Planning Council of St. Louis and the St. Louis Health Division. It was financed jointly by United Charities which paid for the professional services, and the St. Louis Health Division which supplied the secretarial and administrative costs. A committee on "Social Protection for Young Girls," composed mainly of representatives of social agencies, supervised the general direction of the program. A smaller Technical Advisory Committee gave counsel on the medical-social aspects.

This is a discussion of the activities of the medical-social worker in this Venereal Disease Control Clinic; it is not a recording of case work process. The purpose of this paper is to show the way in which medical-social service adapted itself to this venereal disease clinic.

The St. Louis Venereal Disease Control Service operates under a good city ordinance which has been in effect since January, 1939. The Service maintains two clinics for the diagnosis of venereal disease: (1) the Diagnostic Clinic to which persons come voluntarily for examination and diagnosis; (2) the Medico-Legal Clinic to which are brought or referred by law enforcement officers those girls who are found to be sexually promiscuous and who are, therefore, good candidates for examination. Discussion here will be limited to the Medico-Legal Clinic since it was to this clinic that the medical-social worker was originally assigned.

The majority of the girls in the Medico-Legal Clinic were apprehended and detained by the Morality Squad and the remainder by other officers of the St. Louis Police Department. A girl was apprehended on the street, in a tavern or in a hotel at any time her behavior was such that the arresting officer had reason to hold her for "investigation" or for a specific charge. The officers usually questioned the girl at length before taking her into custody. They might take the girl to the district police station for further questioning and detain her there over night, or, take her to the Holdover (the temporary detention quarters at Central District) for investigation and detention. If the girl gave a St. Louis address that could be verified she may have been released

to go home, but was given a notice to report to the Medico-Legal Clinic the next day. Copies of the police reports were brought to the clinic the following morning.

All new patients had blood taken for a Kahn test by the clinic nurse, then a pelvic examination was done by the clinic physician. The clinic physician interviewed each new patient but limited his interview to questions about previous treatment and the extent of the patient's sexual promiscuity. If the girl's first tests and examinations were negative, she was allowed to leave but was given appointments for two more examinations. Each girl had to have three negative smears and cultures and one negative blood test before being released by the Health Division.

At the beginning of the demonstration program it was agreed that the medical-social worker would select her own cases, limiting interviews to (a) girls in the younger age group and (b) those with outstanding problems. Cases were selected by screening the police reports and observing the girls in clinic. Medical histories were available in many instances at the time of the interviews. The interview was begun at the point which seemed most important to the patient but as it progressed facts were discussed relating to family history and relationships, school and work adjustments, patient's interests, activities, and plans for the future. These interviews together with the medical-social worker's observation of the girls in the clinic revealed many enlightening facts about the patient group which have been analyzed.

The clinic patient load was made up largely of girls and women who were chronic offenders, 66 per cent of them having been arrested before. Likewise, 70 per cent of them were in the older age groups. Since selection of patients was planned with the intent of getting the most hopeful prospects for case

work, it is not surprising that this was the first arrest for 91 per cent of the selected patients, and that 64 per cent were under 21 years of age. Many of these girls at first indicated complete satisfaction with their way of life, but as the interview progressed they were able to express their discontent and their desire for help. The majority of patients had been thought of as prostitutes and they had received little individual consideration during examinations. The study of the total Medico-Legal Clinic patients showed that only 10 per cent were prostitutes, while about 30 per cent were underprivileged and misguided girls under 21 years of age. They had been denied the love and security of a normal home and were seeking excitement and attention.

One of the most important revelations of the interviews was the general resentment toward the authority that was responsible for the girls' apprehension, detention, examination, and hospitalization. This had been evidenced in their general behavior, their aggressiveness toward the policemen who accompanied them to clinic, and their protesting their innocence to all clinic personnel. Those who had been detained over night had refused to eat the bread offered them for breakfast, and they made themselves as disheveled and dirty as possible. A further expression of their resentment was brought out in their failure to keep return appointments. Patients with money purchased food for breakfast from a vendor in the building which increased the dissatisfaction of those patients without funds. By the time of examination in the clinic, the new patients had already received misinformation from the chronic offenders about the total Venereal Disease Control process.

With some insight into the reasons behind the patients' unruly behavior the whole clinic personnel worked together to correct some of the causes.

The first step was the separation of old and new patients in the waiting room. Since there were usually only 6 or 7 new patients per day, this gave the nurse an opportunity for a more personal contact with them. She interpreted the reasons behind the Venereal Disease Control Program and could more satisfactorily answer the patients' questions. A policewoman was brought into the picture to see that the patients cleaned up before leaving the Holdover and she accompanied them to the clinic in order to be of service. Increased privacy during examinations was the next step in improving the dignity of the clinic.

Approximately 75 per cent of the total Medico-Legal Clinic group failed to keep return appointments, whereas the selected patient group seldom failed to return. It was felt that the selected patients were keeping appointments because they were given a better understanding of the need for reexaminations, and they were helped to plan for these. The interviews revealed that many girls who were new to the city and who had been brought in by the police did not even know where the clinic was located. An appointment system was tried. Mimeographed slips were given to the girls containing name, address, and telephone number of the clinic, with space for date and time of next examination. At the time the appointments were given, each girl was asked whether or not she could return on the dates specified, and she was requested to notify the clinic secretary by phone if anything should arise to prevent her return. This resulted in a 50 per cent decrease in broken appointments for the total patient group.

In the past, many patients on learning of their infection and the immediate hospitalization that was to follow, brought up many social problems to make hospitalization seem an impossibility. The well behaved patient received an apologetic referral to the hos-

pital, but the troublesome patient was given to understand that the rules were made for her. The disgruntled patient usually managed to escape from the hospital within a few days after her arrival. She was then reported to the police department for arrest on a charge of breaking quarantine and, if found, was sentenced to 60 or 90 days in the workhouse where treatment was completed. Talks with these patients revealed their complete lack of understanding of their illness.

The study of selected patients showed that the majority of them had less than highschool education and the intelligence level of many was questionable. Many of them were infected repeatedly, which pointed up our failure to put across medical information at their level of understanding. This meant that these patients needed a particular approach to their problem and greater understanding and patience on the part of the clinic personnel in dealing with them. With this understanding of patient behavior came an awareness of the clinic's rôle in stimulating certain reactions in patients. It also raised questions about other health, welfare, legal, and military aspects of the program and encouraged interest in experimenting with problems of patient management. Through closer working relationships between all the agencies concerned in the control program came greater understanding and acceptance of the rôle of each. The police prepared the arrested girls for the clinic, and the clinic staff accepted the validity of each arrest. The Supervisor of the Venereal Disease Control Service was able to point up the responsibility of the Venereal Disease Control Service to the community as a whole, which enabled the staff to accept their duties and sell the idea to the patients. The police who accompanied the girls to clinic were finally withdrawn from the clinic to serve a more useful purpose



in the community. The duties of the policewoman were increased to allow for investigation of, and services to, the girls in the clinic. With the release of rationing of coffee, breakfast was served to the girls in the Holdover, and they ate it, knowing the clinic was no longer an eating place. With the establishment of a new Rapid Treatment Center, transportation to that hospital was changed from the Police "Black Maria" to the stationwagon furnished by the hospital.

A better understanding of the patient group not only brought about improved patient management but was effective also in clarifying the social needs of these patients. For the young, non-infected girls prevention and protection was needed. About one-third of the selected group indicated that their present behavior was not in keeping with their established pattern, and they were able to accept referral for service from another agency or to work out their difficulties with some help from the medical-social worker. A few of them had run away from unhappy homes and wanted to remain in St. Louis; others had come to the city looking for excitement but found it too confusing and wanted to return home. There were illegitimately pregnant girls who needed medical, financial, and social service. Unemployment presented no real problem. There were homeless girls, girls with domestic difficulties, and girls needing supervision and guidance. There were existing social agencies that could meet these needs and the medical-social worker referred the girls to these resources. As the clinic personnel came to understand the nature of the medical-social service they began to make appropriate referrals to the worker, giving her the benefit of their observations of patients.

As the program continued, the medical-social worker extended her ac-

tivities to the total clinics, but the discussion here will be limited to the 192 patients selected from the Medico-Legal Clinic on whom there is social recording. Only 42 per cent of this group were found to be infected—but all of them had social problems. The policeman or policewoman, who accompanied the girls to clinic or who referred them here, frequently asked the medical-social worker to talk with a girl. They selected girls who were stranded in St. Louis, who were questionable runaways, or who seemed to be at the mercy of unscrupulous relatives or friends. The clinic secretary referred those girls who were difficult to manage at the point of registration or at the time return appointments were given. Patients who showed emotional disturbance while having a blood test or when informed of diagnosis were referred by the nurse. As infected patients learned the need for immediate hospitalization, many social problems came to light and the patient was referred for help in planning hospital care. The clinic physician asked the medical-social worker to see those girls whose medical examination revealed little sex experience or whose personal hygiene was such that the girl was deemed to be a self-respecting individual who could use redirection. They also referred unmarried girls who were diagnosed as pregnant. The investigators referred girls whom they had known as "military contacts" because they thought the girls needed supervision and guidance. Several girls were referred from the Diagnostic Clinic because they were considered potential Medico-Legal Clinic cases. The medical-social worker selected fewer and fewer cases as other personnel referred patients to her. By the end of the year it was found that the worker had chosen only 47 per cent of the total selected patients.

It must be remembered that the pur-

pose of the interview was to determine the girl's problems, her capacity for accepting help, and to bring about her application for assistance from a local social agency when indicated. Each case was cleared with the Social Service Exchange, which is the central registry of all social agencies of the city. In 29 per cent of the cases patients were known to the Social Service Exchange. In a few instances the patients were under care of social agencies; in other instances agencies agreed to resume activity on cases previously known to them.

Nineteen different social agencies coöperated in working with 42 per cent of the 192 patients. A few girls failed to report to the agencies to which they were referred, but for the most part they followed through on the referral and showed a positive response to the service offered. If a girl behaved in an immature fashion, or if the suitability of her living arrangements was very questionable, the medical-social worker assumed major responsibility in getting the patient to accept supervision of a social agency in order to keep out of further difficulties. The medical-social worker accompanied a few girls to the office of the agency accepting referral because it was felt to be in the best interest of the girl. Several agencies reported that in a number of cases the girl's personality was too damaged for her to be able to use the service of the agency. About 5 per cent of the girls were known to be mentally deficient and in need of institutional care, but facilities for this were lacking. These were the girls who became infected repeatedly. Many of them had illegitimate children who had been removed from their custody and were being supported by public funds. For the protection of the girl and society, institutional care seemed to be the only answer, but until such resources are available these girls are being referred to social agencies for supervision.

The Travelers Aid Society accepted the stranded non-resident girls and in most instances returned them to their place of legal residence, after investigation proved this to be the best plan. The girls' protective agency accepted young girls who were in need of close supervision and direction and helped them with this along with suitable housing, employment, and recreation. Family agencies assumed responsibility for those girls whose domestic situations were complex and helped them to find solutions to the problems that were responsible for their misbehavior. An infants' home boarded babies so that infected mothers could be hospitalized. The Public Assistance Agency assumed case work activities with members of their client's family who became clinic patients, and offered financial service and help to others. The American Red Cross accepted the servicemen's wives who were stranded or confused over marital problems. The new Rapid Treatment Center, through its psychiatrist and psychiatric social worker, helped the infected patients who showed unusual emotional disturbance.

Fifty-seven per cent of the selected patients were not referred to social agencies because either the patient or the medical-social worker saw no need for referral. Some of these were girls who had been in the city only a short time but found living in St. Louis very confusing and returned home on their own. Others were resident girls who seemed to make satisfactory adjustments, with some assistance from the medical-social worker. In many cases parents, husbands, relatives, or friends of the girl were interviewed and they were able to carry the burden of responsibility in redirecting the girl's activities. The medical-social worker tried to assure each patient of our continued interest in her and our availability for future help.

The medical-social worker was asked to confer regularly with the supervisor of the clinics on questions of policy and procedures and was used in a consultant capacity by the public health nurses and investigators. Other social agencies used the worker as a liaison person in discussing the medical-social problems of their clients coming to the clinic.

#### CONCLUSIONS

One year is a very limited period within which to do a demonstration job, to analyze the program and to draw conclusions, but certain things have been shown. The findings are summarized as follows:

1. For good patient management in a venereal disease clinic, there must be an understanding of the patient's social as well as medical problems.

2. Privacy for examination and interviews are important in obtaining a patient's acceptance of medical and social diagnostic procedures.

3. Many girls coming to the Venereal Disease Clinic under the auspices of law enforce-

ment officers are not habitual offenders and can benefit by social services. Many are young girls whose living environment is unsatisfactory and who are deprived of normal parental love and guidance. Many are of low mentality and, therefore, easily influenced. For their own protection and that of the community, these girls needed a supervised environment.

In the group studied only a few of the girls were rearrested. This leads us to believe that more individualized handling and careful explanations, along with consideration of the girl's problem and case work treatment have been conducive to bringing about a change in the girl's behavior pattern.

4. From experience we have learned that a more sympathetic handling of patients makes for better patient cooperation as far as treatment is concerned, and also reduces the risk of spreading the infection.

5. For a successful venereal disease control program it is essential that individuals as well as community agencies and organizations understand the importance of control measures, especially as they relate to protection and prevention.

6. The total cooperation of the law enforcement, health and welfare agencies is necessary for a successful venereal disease control program.

# Control of Typhus Fever in Mexican Villages and Rural Populations Through the Use of DDT\*

CARLOS ORTIZ-MARIOTTE, M.D., M.P.H.;  
FELIPE MALO-JUVERA, M.D., M.P.H.,

AND

GEORGE C. PAYNE, M.D., DR.P.H., F.A.P.H.A.

*Epidemiologist, Ministry of Health and Welfare, Mexico; Instructor in Public Health Administration, Ministry of Health and Welfare, Mexico; and Field Director, International Health Division of The Rockefeller Foundation*

THIS paper is a progress report on work which represents the contribution of the Ministry of Health and Welfare of Mexico to the study of the control of typhus fever through delousing with DDT in the form of powder. It is a continuation of work which was begun in January, 1943, at the request of the Office of Scientific Research and Development, by Dr. W. A. Davis,<sup>1</sup> who tried delousing with preparations which had pyrethrum products as their base. His work was followed in May, 1943, by a request for the coöperation of the Mexican Government in field studies in the use of the product which is now popularly known as DDT. Provision was made for the release of DDT for a prolonged experiment in which the objective would be

to render a community free of body lice and to maintain it in that condition. Later it was found convenient to combine this objective with that of controlling active epidemics of typhus fever.

With the powder which was standard for army use at the time of his experiments, Davis demonstrated that the infestation of a town could be reduced from about 60 per cent to below 4 per cent with a single treatment applied to 98 per cent of the population. The results were striking, and there is no doubt that they would have been sufficient for the control of an epidemic of typhus fever. Nevertheless, these results were not lasting, and a few months later the infestation had reached almost its original level.

The study here reported is being carried on in the same region of the central plateau of Mexico in which Davis worked and, except in two villages which will be mentioned below, it has been independent of the presence of typhus fever. Successive villages are selected with the purpose of rendering them free of body lice and maintaining them in that condition by the use of

---

\* The studies on which this paper is based were conducted by the Bureau of State Health Services and the Bureau of Epidemiology of the Ministry of Health and Welfare of the Government of Mexico, with the support and under the auspices of the International Health Division of The Rockefeller Foundation. The work was undertaken at the request of the Bureau of Entomology and Plant Quarantine of the United States Government. This Bureau obtained the release of materials for the work, and through the personnel of its insecticide laboratory in Orlando, Fla., it gave valuable counsel on the conduct of the studies.

DDT powder in 5 per cent concentration. A map of each village is made to guide the work, and a careful census is taken of every family. A team of field workers consisting of a nurse and a sanitarian examines the residents of each house for lice, both on the clothing and on the scalp. The DDT powder is applied thoroughly to the clothing in contact with the skin. Single applications have been tried as well as series of two and of three applications at intervals of a week or more. The treatment of the clothes is accompanied by a treatment of the scalp with a lotion of which the basic ingredient is phenyl cellosolve.<sup>1</sup> This brings about temporary elimination of head lice and is repeated at each visit when reinfestation is found. In order to reach every resident of the village, Sundays and evenings are included in working time. The period of treatment is followed by several months of observation, during which examinations are repeated at intervals to measure the rate of return of infestation.

After the work had been in progress for some time in villages where typhus fever was not present, it was decided that delousing should be undertaken in San Francisco Tlalnepantla, a village where there was an epidemic of the disease, which was endangering the important town of Xochimilco. Delousing was later carried out in the presence of a similar epidemic in the village of San Lorenzo Oyamel in the State of Mexico. From the standpoint of this study these villages are essentially similar. Both are at an altitude of between 7,500 feet and 8,000 feet above sea level and have a temperate climate, with cold nights throughout the year. Agriculture, especially the growing of maize, is the chief occupation. The population is predominantly Indian, although the people of the two villages are of different types. The homes are generally poor, and in many the entire

family is housed in a single room. Living conditions and inadequate facilities for washing favor the maintenance of parasitization.

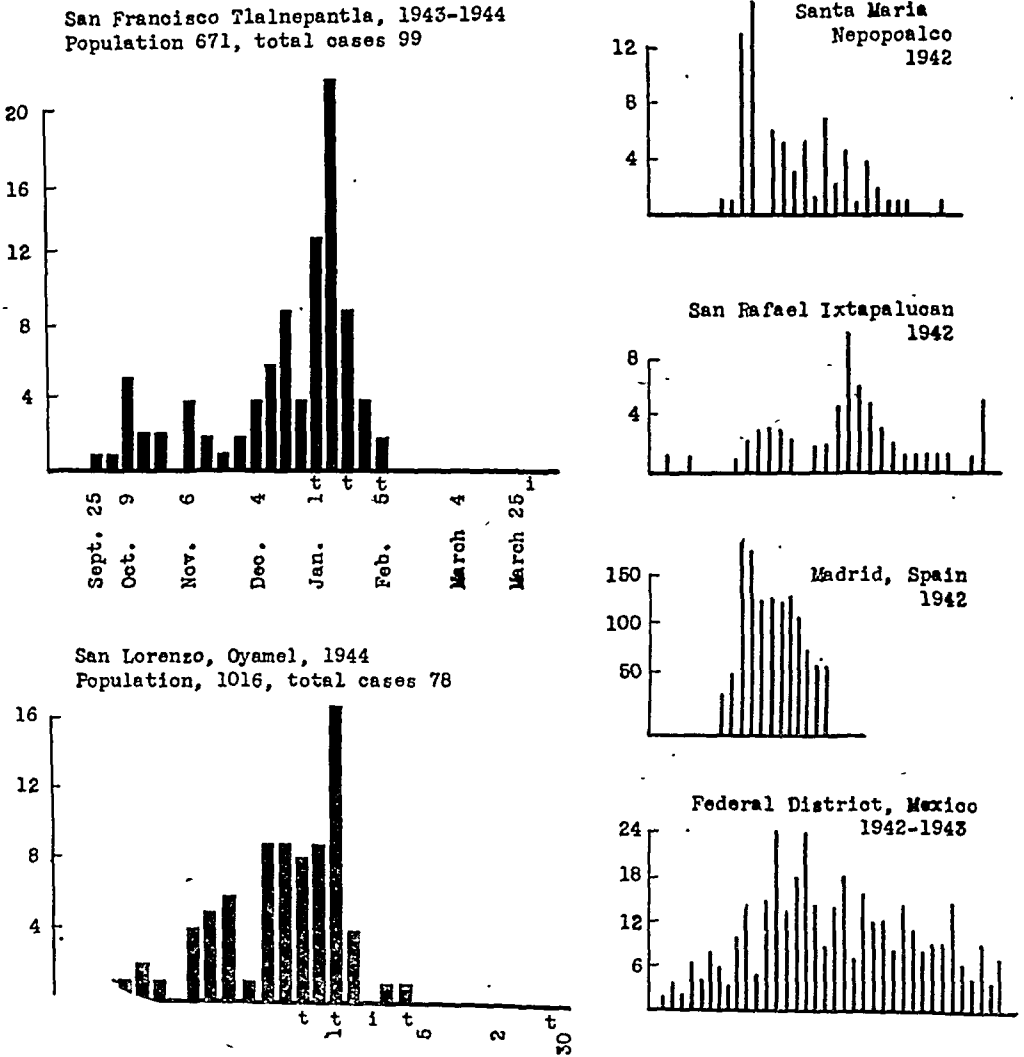
In both villages the epidemiological investigations were conducted by one of the authors, an epidemiologist in the Ministry of Health and Welfare, by house-to-house visits which were repeated as often as necessary. At the same time delousing groups were visiting the homes and were of service in discovering cases of typhus which might otherwise have remained hidden. The diagnosis was based both on the clinical picture and on the results of the Weil-Felix reaction, which was determined for a sufficient number of persons in each village to establish the nature of the epidemic.

In the village of San Francisco Tlalnepantla, with a population of 671, the epidemic began in September, 1943, and reached a peak in the week ending January 8, 1944, when 22 cases appeared. The first application of powder for delousing began on January 4 and ended on January 10, during which time 430 persons were attended. In the three weeks following the application of powder new cases of typhus appeared as follows: first week 11, second week 4, third week 2, and with these the epidemic ended. The application of powder in house-to-house visits was repeated twice subsequently, ending in the second week of February. Careful search on these visits disclosed no new cases. While the delousing of this community was sufficient for stopping the transmission of typhus fever, it was not adequate for the permanent reduction of the infestation. In spite of the efforts of the staff, only 612 of the population of 671 were examined and treated.

The village of San Lorenzo Oyamel had a population of 1,016, living in scattered houses and working at agriculture and pottery. Difficulties of

FIGURE 1

Distribution of Cases of Typhus Fever by Weeks in Six Epidemics  
Treatment with DDT 5 per cent was used in San Francisco Tlalnepantla and in San Lorenzo Oyamel at the points indicated by "t." Inspections for cases and parasites were made at the points indicated by "i." DDT was not used in the other epidemics and they are shown for comparison of the types of distribution of cases with and without general delousing.



ment began and 13 days after it was completed. During that week 4 cases appeared, as compared with 17 in the week before. House-to-house searches with new treatments were repeated during periods beginning on June 30, August 1, and September 24, and an additional search was made of all known family contacts on July 17. These searches disclosed that single new cases appeared in the weeks ending on July 22 and 29.

The evidence obtained in those epidemics indicates that application of DDT in 5 per cent concentration provides a method of delousing for typhus control which can be applied with little equipment and with personnel which is available in local health services. It is simpler and cheaper than most methods of delousing which have previously been in use. Further experience which is not reported here indicates that the control of an epidemic might be brought about by thorough delousing of contacts alone.

The primary objective of these studies, elimination of lice from a village and maintenance of the louse-free condition, presents more difficulties than temporary delousing to stop the spread of typhus infection. Infestation with lice is common in all of the villages and the attainment of the objective means that every person must wear treated clothing for a period which has not yet been determined. The first difficulty is that of achieving universal treatment in a community. At best about 98 per cent of the population can be seen in a series of three treatment periods, in each of which every house is visited several times. The persons not found are those who are at home at irregular intervals, and for that reason are important potential sources of reinfestation for other members of the families. Other difficulties are the local holidays, when the village is filled with visitors for days at a time, and holidays in un-

treated villages when the treated persons spend equally long times in these communities.

Through an extension and an intensification of the methods already described an attempt was made to reach the primary objective. That is, our purpose was to apply 5 per cent DDT powder to all of the clothes of every villager by a series of two or three visits at intervals of a week or more. By successive visits for subsequent inspection it was hoped that the duration of the expected period of freedom from lice could be measured and also that the rate of return of infestation could be determined. The results of these efforts to the end of September, 1944, are summarized below.

*La Concepción Coatepec:* original infestation, clothes 64 per cent, scalp 75 per cent; clothing treated with MYL and the infestation reduced to 3.2 per cent on March 1, 1943. By July 13, infestation in clothes had risen to 52 per cent. One application of powder 153 and one of DDT 5 per cent reduced the infestation to 6.5 per cent on August 11, but it rose again to 24 per cent on October 13, with 48 per cent of scalps also infested.

*San Juan de la Isla:* original infestation, clothes 33 per cent, scalps 52 per cent; clothing treated with DDT 5 per cent on June 8 and June 21; without more additional treatment than was absolutely necessary to maintain co-operation, infestation was observed as follows: July 5, 1.6 per cent; August 4, 1.1 per cent; September 6, 2.3 per cent; October 5, 9.5 per cent.

*San Andrés Ocoacán:* original infestation of 60 per cent in clothes and in scalps; one treatment of clothing with DDT 5 per cent was given on July 27, and on August 9 the infestation was 11 per cent. Because of lack of materials no more treatments were administered, and the level of infestation on October 11 had risen to 26 per cent.

*San Lorenzo Oyamel*: initial infestation, 89 per cent in clothing and 86 per cent in scalps; treatment of clothing with DDT 5 per cent on June 20, June 30, and August 1. The infestation on August 1 was 4.4 per cent in clothes and 4.8 per cent in scalps. An additional treatment was given at that time, and on September 24 the infestation was 11 per cent in clothes.

As previously indicated, the effect of the phenyl cellosolve lotion was not lasting. Examinations made within a week after treatment usually showed good results, but follow-up examinations revealed rapid reinfestation. The best results were in San Lorenzo Oyamel where, in the examinations of August 1, those persons who had been treated during the visits of June 20 and June 30 showed scalp infestation of only 1.7 per cent. During the visit of September 24 the same persons showed an infestation of 21 per cent.

#### SUMMARY

1. A progress report is presented on studies in delousing the inhabitants of Mexican villages through application to the clothing of powder containing DDT in 5 per cent concentration and application to the scalp of a lotion of which the basic ingredient is phenyl cellosolve.
2. With two exceptions, typhus fever was not present in the communities in which delousing studies were made. In two villages where studies were carried out while epidemics of typhus were occurring, the epidemics subsided rapidly after the application of the DDT powder.
3. The elimination of lice from a village and the maintenance of the louse-free condition has been found to present more difficulties than temporary delousing to stop the spread of typhus infection. The chief difficulty encountered is that of achieving universal treatment in a community.
4. The effect of the phenyl cellosolve lotion on head lice has been found to be only temporary.

#### REFERENCE

1. Davis, W. A., Malo-Juvera, Felipe, and Hernandez-Lira, Pilar. Studies on Louse Control in a Civilian Population. *Am. J. Hyg.*, 39:177-188 (Mar.), 1944.

## Gamma Globulin for Measles

In connection with the editorial under the above heading in the July issue of the *American Journal of Public Health* (page 732), Dr. John B. Alsever, the Director of the Civilian Blood Donor Service of the American National Red Cross, Washington, D. C., makes the following supplementary statement.

"The gamma globulin now available for civilian use is derived as a by-product in the preparation of serum

albumin for the U. S. Navy. In 1944 supplies of crude gamma globulin were accumulated in excess of the needs of the Army and Navy, and the surplus was assigned by the Navy to the American Red Cross for distribution. The costs of processing the crude material and of distributing the finished product are met by the American Red Cross, and the gamma globulin is supplied without charge to state and territorial health officers at their request."



# Streamlining Hospital Techniques\*

MANY will complain that streamlining is an overworked word, that dressing up the outside may not improve the content. Yet streamlining does have one connotation we can all support in wartime or, for that matter, in peacetime—stripping nonessentials and bringing essentials into bold relief. *All public health workers have been concerned over the potential and actual dangers involved in staff shortages. In maternity wards and new-born nurseries these shortages may be serious. It is hoped that in presenting a symposium on this subject, the participants will give the readers of the Journal from*

their experience, not a magic formula, but the approaches which seem to bear the greatest promise of success in achieving the desideratum of safe and adequate care for mothers and babies.

By and large, present-day hospital techniques have been developed from experience—certainly a desirable method. *This gradual development carries with it, however, the danger that procedures which have been outmoded may not be discarded when they have outlived their usefulness. Periodic review and evaluation is certainly essential, and it is most important to approach such a review with an open mind and a true skepticism.*

\* Based on papers presented at a Joint Session of the Maternal and Child, and the Public Health Nursing Sections of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

MYRON E. WEGMAN, M.D., F.A.P.H.A.  
*Chairman, Maternal and Child Health Section*

## Meeting Maternity Nursing Needs in Wartime

BERTHA PIERACCINI, R.N.

*Assistant Principal, School of Nursing, Margaret Hague Maternity Hospital, Jersey City, N. J.*

THERE are a number of approaches to the problem of meeting the need for nurses during the present national emergency. In the Margaret Hague Maternity Hospital we have used most of these. I would like to discuss how we have adopted administrative and educational procedures which have materially aided us in the maintenance of the standards and policies of the institution; namely, safe and adequate nursing care for mothers and babies. This hospital in addition

to being the largest maternity hospital in the United States is essentially a teaching institution. An active teaching and supervisory program had to be maintained at all times. In order to accomplish this in the face of impending shortages of personnel, a committee was formed to make a survey of all departments in the institution. Nursing procedures and functions were re-evaluated and nonessentials eliminated from nursing procedures. All non-nursing functions have been delegated

to workers who have been educated and trained for the specific duties they are to carry out.

#### USE OF AIDES

Planned programs of classroom instruction and close supervision of the worker in the field of operations have been of considerable help. Early in 1942, at the suggestion of our local Red Cross Chapter, we gave a series of courses to our employees in home nursing. About 200 employees completed the course. These classes were taught by members of our nursing faculty who held Red Cross teaching certificates.

This provided a group of individuals within the institution, trained to carry out non-nursing duties. From this group we selected twenty who were interested and who showed an aptitude for nursing. A thorough orientation in the department in which they were to function was given to each worker by a member of the education department. A supervisor under whom they were to function was then responsible for their activities.

These non-professional workers carry the title of "Aide to the Nurse" (not Nurse's Aide). The original group of twenty aides has grown to sixty. They are working in all departments of the hospital, with the exception of the labor and delivery suite, and the premature nursery.

Briefly, the duties of the aides in specific departments are as follows:

#### DUTIES OF AIDES TO NURSES IN POSTPARTUM FLOORS

After the nurse has given essential care to the patients, the aide

- Removes soiled equipment
- Measures urine and records amount in book
- Cleans and sterilizes bedpans
- Is responsible for completion of bedside unit
- Makes tops of beds after nurse has bathed patients and made lower parts of beds

- Makes beds of all discharged patients, also ambulatory patients
- Cleans perineal carts after routine perineal cares have been given
- Cleans and sterilizes perineal cart equipment
- Sets up perineal carts for use
- Cleans and reëquips breast carts
- Exchanges supplies at central supply room

With the elimination of these non-nursing functions, the nurse devotes her full time on duty to the performance of such purely nursing activities as giving baths, taking temperatures, giving treatments, and charting.

#### FUNCTION OF AIDES IN THE NURSERIES

- Diaper babies
- Collect, check, and heat formulae
- Feed babies after first 24 hours after delivery
- Crib making
- Help push cribs into patients' rooms at nursing time
- Prepare position of patients for nursing babies
- Exchange nursery supplies at central supply room

This gives the nursery nurse an opportunity to concentrate her activities on:

- General well baby care
- Special attention to ill babies
- Breast care and education of mothers in techniques of nursing babies
- Breast pumping

We are also using the Red Cross volunteer nurse aides in a limited capacity in our nurseries and on the post-partum floors. During the current year, the Red Cross Chapter requested that we use our institution as a training center for the advanced volunteer nurse aides who were interested in volunteering their services as aides in the maternity departments of the hospitals of the community. A course outline for "Red Cross Volunteer Nurse Aides Experience in Obstetrical Nursing" was submitted and accepted by the Eastern Area of the Red Cross.

Only those aides who had given 150 hours of satisfactory nursing service were permitted to enroll for the course,

which consisted of 8 hours of classroom instruction and a planned program of supervision. The classroom lectures were given by a member of our education department. Prior to this assignment for service, each aide received 15 hours of individual supervision in post-partum and nursery activities by a member of our nursing staff.

The activities permitted these Red Cross volunteer nurse aides are much broader than those of the regular aides. They are permitted to give baths to patients on their 4th day post-partum, make beds, and take the temperatures of mothers and babies. The charting is done by the nurse.

Formula preparation for more than 200 babies daily is done centrally as is the care of breast milk collected throughout the hospital. This central department carries out these functions with a staff of two nurses, one of whom is the supervisor, three aides, and two maids. The formulae are prepared by the nurses. The aides pour the prepared formulae under aseptic technique. Each aide wears a madonna cap and mask, scrubs her hands, dons gown and gloves; she labels, fills the bottles and seals them under the supervision of a graduate nurse who checks and double-checks the individual formula order cards against the bottles being filled. Other duties of the aide are chiefly the preparation of equipment for sterilization. The care of rubber nipples, breast shields, cleaning and replacement of equipment for breast pumps is strictly the responsibility of the nurse.

We formerly operated our formula room from 7:00 a.m. to 11:00 p.m. Now, with concentration of activities, we operate from 7:00 a.m. to 4:30 p.m. Extra bottles of our standard formulae are kept on hand, so that if an emergency should arise, needed formulae may be obtained at any time during the night.

The central supply room is another

department which functions with aides, under the direct supervision of graduate nurses. Supplies for the entire hospital, with the exception of the formula room, and our septic division where they have individual sterilizing units, are prepared and sterilized by ten aides. Two large sterilizers are operated. Assistance in operation is given by a porter when loading and unloading occurs. The central supply room is in operation 24 hours a day. The duty hours of the aides are arranged to give concentration of workers during the period of the day when the preparation and issuance of supplies is heaviest.

#### CHANGES IN NURSING TECHNIQUES

The greatest change in nursing techniques was made on the labor and delivery suite. In this department, we experienced a shortage of doctors as well as nurses. To facilitate activities, we substituted the sterile delivery bundle for the drum technique. This resulted in a saving of about 20 minutes for each delivery set-up, and also saved on linen which, if not used, could be resterilized.

The delivery bundle contains all the linen and equipment needed for a delivery, viz., draping material, extra towels, prep tray with specimen bottle and catheter, and an instrument roll which contains 19 instruments, placed in the order in which they are to be used during the delivery. The instruments are held in place by a one inch twill tape stitched to the required spacing.

Once the drapings and baby linen are placed, the table can be set up in three steps. The prep tray on the upper right of table, extra towels on left side, and instrument roll opened. Initial prep tray, large basins, placenta basin and obstetrical forceps are separately wrapped. Eight delivery rooms are kept set up with this technique at all times.

Aides are not used in this depart-

ment but we have always used maids for cleaning delivery rooms, removing soiled linen and checking instruments. They also help in handling patients ready for delivery.

#### OTHER TRAINING ACTIVITIES

Because of our heavy teaching program, including both affiliate and postgraduate students, it is necessary to maintain a large staff of graduate nurses and ward instructors. These instructors have completed our postgraduate and supervisory courses in obstetric nursing. This supervisory course gives the students who have completed the 4 months' postgraduate course an extra 2 months of instruction and experience in supervision, also practice in conducting a ward teaching program. For experience in the field of supervision, these graduate students are rotated in the services and act as student assistants to the supervisors. Those who show an aptitude for teaching are given positions as ward instructors in the various services of the hospital where students are assigned.

With the constant rotation of students, the supervisors of all departments carry a heavy burden of responsibility. They are responsible for the smooth functioning of the departments, the activities of the nurses and aides, as well as organizing and carrying out an active ward teaching program.

The program in operation throughout the hospital is flexible and adjustments are made when the need arises. With the increased numbers of students enrolled in the U. S. Cadet Nurse Corps, our affiliate students have increased in proportionate numbers. This has placed a tremendous burden upon the education department.

#### SUMMARY

In summary, we are meeting the present emergency situation in three general ways.

- 1 By training and using a large number of nursing aides.

- 2 By analysis and reorganization of departmental activities.

- 3 By training affiliate and postgraduate nurses for the positions opened by the expanding demands for hospital care.

## Nursing Techniques in Maternity Hospitals

RUTH M. OLSON, R.N., AND MARTHA L. CLIFFORD,  
M.D., F.A.P.H.A.

*Public Health Nursing Consultant (M.C.H.); and Director, Bureau of Child Hygiene, State Department of Health, Hartford, Conn.*

THE tremendous increase in births in recent years combined with the decrease in hospital personnel has presented a major problem in furnishing adequate hospital care. This discussion will be limited to the nursing phases of the problem although success of any program has to be based on wholehearted cooperation by all persons and services.

The four major areas of nursing

service in a maternity hospital are: (1) labor and delivery service, (2) care of postpartum mothers, (3) care of newborn infants, (4) preparation of formulae. To these can be added instruction of the mother in care of herself and her baby and education of the public as to the need for community cooperation in the maternity problem.

In Connecticut each of the hospitals caring for maternity patients served

as a source of information in studying and solving these problems. In some of the larger cities where two or more maternity hospitals exist, joint plans were made resulting in better service to mothers and babies and increased co-operation on the part of the public.

After thorough study a number of concrete suggestions as to how these problems could be met were adopted. Some of these will be discussed in the following paragraphs.

#### LABOR AND DELIVERY STAFF

Since constant supervision of patients during labor and delivery is essential, these services should be fully staffed both day and night.

#### POSTPARTUM CARE OF THE MOTHER

This can be greatly simplified without jeopardy to the mother's safety. After the first 24 hours, most mothers feel very well, they move about freely in bed, and, except for the aseptic care of the perineum and of the breasts, can readily bathe themselves. A simple method of perineal care carefully carried out once a day and following defecation with application of dry sterile pads at other times has proved safer than more frequent care which tends to become careless due to pressure of work. Individually wrapped packages containing a pad and 5 to 6 cotton balls and individual forceps sterilized after each use provide a simple safe technique. Bedpans should be sterilized after each use or kept at the bedside and sterilized after discharge of the patient. Newspaper bedpan-covers discarded after one use, will prevent contamination of bedpans by cloth covers used several times. Convenient hand washing facilities and insistence upon their use before and after handling every patient will do much to lessen the danger of cross-contamination of patients.

Breast care is another technique

that can well stand careful scrutiny. The procedure of swabbing before and after each nursing with boric acid solution has proved in many instances an ineffective ritual which in itself may be a source of contamination. Many hospitals have found that careful bathing of the breasts once daily followed by covering them with a clean towel has proved quite satisfactory. Discontinuing the use of breast and abdominal binders except for specific reason is another means of saving nursing time.

#### CARE OF BABIES

Two principles involved in nursing care in nurseries for new-born infants are:

1. Prevention of introduction of infection from outside

2. Prevention of infection between infants

1. The number of persons entering the nursery should be strictly limited to the number necessary to give care. Nurses assigned to the nursery should not care for any other patients where infection may be present. Private duty nurses should not be permitted in the nursery. Any person entering the nursery should wear a gown and an effective mask over the nose and mouth. Doctors and nurses should wash their hands thoroughly before entering the nursery and before and after handling each baby.

2. The care of babies should be completely individualized. Infants should not be bathed or changed on a common table, and anything coming in contact with the baby should be scrupulously clean and, if possible, sterilized.

*Care of the skin*—A modified Sanford method is recommended because from all available evidence it is fully as effective as any other method of care and it takes the least amount of nursing time. Immediately after birth, the blood is wiped off and excess vernix is carefully removed from the folds of the skin, especially from armpits and the

groins; thereafter, the clothes are changed daily but the baby is not bathed or oiled until discharged.

*Dressing and diapering*—Dressing and diapering should be done in the baby's own bassinet or on adjoining tray or individual table (not on a common table).

*Weighing*—Weighing and the recording of weight is very time consuming. Reduction of the frequency of weighing would save nursing time proportionately as well as reducing the possibility of infection by daily use of the common scale.

#### FORMULA PREPARATION

*Principle*—Because the formula or milk mixture is an important possible source of infection for new-born infants, formulae should be prepared and kept under strict, aseptic conditions and handled as little as possible.

*Attendant*—Formulae should be made by the nursery nurse or by a dietitian. An effective mask over the nose and mouth should be worn while formulae are being prepared.

*Procedure*—All equipment and material used in the preparation of formulae should be sterile. It is recommended that formulae or milk mixtures be put up in individual bottles, nipple, and nipple protector applied, and the whole sterilized. Formulae should be cooled immediately and placed in a refrigerator kept at 50° F. Nipple protectors are made of Pyrex glass or aluminum and completely cover the nipple, resting on the shoulder of the bottle. During sterilization, heat and suction causes them to cling to the base of the nipple. The nipple protector should not be removed until immediately before the nipple is to be put in the baby's mouth. This procedure sometimes breaks down in the nursery at feeding time, when often many nipples must be changed because they are too soft or too hard for individual

babies. If a nursery nurse, who is acquainted with each baby, prepares the formulae, she can choose, and place the right type of nipple for the bottle of each baby when preparing formulae and so prevent possible contamination of changing nipples.

*Breast feeding*—Perhaps I should refrain from any discussion of this subject, since in spite of the continued assertions of physicians and nurses as to its value, the percentage of breast-fed infants is so small as to be almost nil. Even the fact that the psychiatrists have joined the ranks of breast-feeding advocates by stressing its emotional advantages has had little effect. If the baby must be bottle-fed we feel this should be done by the mother who thus learns the technique of feeding and bubbling and becomes better acquainted with her baby. The custom of propping bottles in the nursery is dangerous since the infant may aspirate the milk. Moreover, it fosters a poor habit of associating the bottle with sleep instead of with eating.

Many other hours of nursing time have been saved through coöperation of physicians, hospital administrators, public health nursing, and other agencies. The changes in procedure which I have discussed have all been brought about with the approval of physicians responsible for obstetrical services in hospitals. In addition, many hospitals have shortened the hospital stay of maternity patients to handle the increased load; such routine procedures as four hourly temperatures, routine measuring of intake and output have been omitted; a limited number of stock formulae have replaced the many formerly ordered; babies have been weighed only two or three times a week, and many other time-consuming procedures have been omitted. Through coöperation with Jewish organizations the number of guests at ritual circumcisions has been reduced. Much time

can be saved through restricting visitors, limiting viewing of babies, and setting rules for receiving and care of flowers. Such restrictions may arouse antagonism unless the reasons are made clear.

One of the important functions of personnel working on a state level is the observation of techniques in various hospitals, the evaluation of these techniques, and transmission of the desirable features to other hospitals. The support of the state agency in the form of uniform regulations may be invaluable.

#### CONCLUSION

Streamlining nursing techniques in maternity services has been successfully carried out in Connecticut with the resultant saving of many hours of

nursing time while continuing to give safe care to a greatly increased number of mothers and babies.

Through coöperation of hospital administrators, physicians, nurses, public health agencies, and other organizations, many changes have taken place in procedures long considered essential but which upon careful analysis proved to be alterable.

When conditions due to the war are over, nurses look forward to including again many of the niceties of care which of necessity have been curtailed. We are convinced however that this experience has drawn us back to fundamental principles of care from which we can proceed intelligently, rather than blindly following outmoded and unessential rituals.

## The Point of View of the Public Health Physician

VIKTOR O. WILSON, M.D., M.P.H.

*Director, Division of Child Hygiene, Minnesota Department of Health,  
Minneapolis, Minn.*

HOSPITAL service, public health, and medical care are the three basic activities forming the structure of health service for the people. There is a growing realization that these three activities are fundamentally inter-related, and one is not complete without the others. The importance of hospital service in this relationship is particularly apparent in the field of maternal and child health in which there is a growing tendency toward having all confinements in hospitals. From this point of view, the public health physician, whose function is the protection and promotion of health for all the people, has an active interest in hospital service. He represents the public's interest, but only under the limitations of whatever authority the public has given him by legislative

enactment. With respect to hospitals the public interest is most commonly expressed in the form of a governmental program of inspection, approval and licensure. How does a licensing program affect the streamlining of hospital technics?

In April, 1941, the Minnesota Legislature passed a bill requiring the annual licensure of all hospitals and related institutions which after inspection meet the approval of the State Department of Health. This law also transferred to the Minnesota Department of Health the licensing function under the state maternity hospital law, which prior to this time, and since it became effective in 1918, was administered by the State Welfare Agency. Specifically with respect to maternity care the laws provide for the establishment of special require-

ments for public and private maternity hospitals, and cover all places receiving more than one maternity patient within a period of six months.

The purpose of this legislation, it may be assumed, was to insure safe and adequate care for patients in places other than their own homes. To provide safe and adequate care a hospital must be operated efficiently. Therefore, any effective program developed to carry out the purpose of this legislation will, at the same time, promote hospital efficiency. In what ways does a licensing program do this?

First, standards are necessary as a basis for issuance of licenses. In Minnesota, the law empowers the State Health Department to establish reasonable standards which it finds necessary in the public interest. Under the provisions of the law this function is carried out with the assistance of an advisory board composed of four representatives of the Minnesota Hospital Association, two representatives of the Minnesota State Medical Association, and the State Director of Public Institutions. Standards have been established which in general cover the physical plant, accommodations for patients, equipment and facilities for care, adequacy of personnel, and reports and records. The development of sound standards and their persistent application through periodic investigation and under the compulsion of annual licensure should prove an effective measure for the development of efficient and safe hospital procedures.

Second, the Minnesota Department of Health requires the submission of plans and specifications covering any new construction for review and approval for compliance with licensing standards. This review of plans provides opportunity to promote streamlining of hospital technics.

A concrete example of the benefits to be obtained from this measure is in

the review of plans for adequacy of utility rooms. The lack of adequate work and storage space and equipment and supplies will cause much unnecessary work and will limit the efficiency of the nursing service. Our experience indicates that this requirement for utility rooms has been frequently overlooked in the construction of hospitals. Also, there is probably no improvement more difficult to obtain after the hospital is operating to capacity. Therefore, the Minnesota licensing standards include the requirement that there shall be adequate space and facilities for the proper cleansing and storage of nursing supplies and equipment, that suitable provision must be made for preparation of medications and treatments, and that utility rooms should be conveniently located for efficient conduct of the work. Also, they must have outside exposure and satisfactory lighting and ventilation. These requirements are applied very carefully in the review of plans for new construction so as to prevent future failures in provision for utility rooms. In a number of instances architects and sponsoring organizations have been asked to revise plans for relocation of these rooms to outside walls, or to enlarge them to provide more counter and cupboard space.

Another example of how the review of plans promotes efficiency of nursing service is the check made for compliance with the requirements for hand-washing facilities. Emphasis is placed on an adequate number of fixtures conveniently located in work areas, and on the design of the fixture with respect to comfort and ease of hand-washing. In the review of plans it has been possible to point out how the provision of a well designed scrub-up sink, or the relocation of a lavatory, may save many steps and much time for the nurses.

Surveying hospital technics is a third activity which gives opportunity for promoting streamlining. In the survey,



the objectives have been area segregation of activities, provision of adequate equipment, and simplification of procedures to achieve a safe and adequate care. Suggestions for improvement are worked out with the hospital staff. These surveys are carried out at the request of the hospital, and are also made in conjunction with the epidemiological investigation of outbreaks of infection in the maternity department. Although they have not been made a part of the routine investigation, we believe a licensing agency should be prepared to give this service on a consultation basis.

In Minnesota it has not seemed practical to prescribe specific procedures for all hospitals. There are three reasons for this point of view: (1) the procedure must be adapted to the individual situation; (2) routine supervisory visits cannot be expected to control the daily observance of a given method; and (3) sufficient funds are not available to finance detailed investigations in all hospitals. Also, we believe that the hospital should assume responsibility for the details of the procedure. However, the licensing agency should meet its responsibility for safe and adequate care by establishing requirements for qualified personnel which will promote hospital responsibility and for adequate and convenient facilities which will enable the personnel to work efficiently.

In addition to the physical improvements indicated there are many routine hospital procedures which permit of streamlining, such as simplification of skin care, individualized crib care in the nursery, the elimination of a.c. and p.c. weighing of every new-born infant, simplification of perineal care and breast care technics, and reduction of temperature taking. Hospitals should study these and other procedures with the object of simplification, retaining all that is necessary to protect the

adequacy and safety of the care.

In making this study, the hospital should follow a thoughtful and purposeful plan of procedure. Unquestionably, streamlining of technics is most easily accomplished in the hospital where there is standardization of care, rather than a variety of procedures. This requires unanimity of opinion among the physicians. Streamlining is desirable from the standpoint of the hospital administrator because it will reduce cost of nursing care, and we may assume that he will cooperate in securing any new equipment which may be needed. The experience and training of the nursing staff in the development of details are also necessary. From the foregoing it is obvious that streamlining of procedures must be a cooperative project, and it will be necessary for the hospital staff to organize for the purpose. The following course of action is suggested:

1. A committee of physicians should be appointed to determine basic needs of care.
2. The nursing staff then develops the technics for giving the care.
3. The proposed technics are then presented to the medical staff for final consideration and approval.
4. Finally, revised procedures are put into effect. This will necessitate making the written routines easily available to all personnel on the hospital floor, and delegating responsibility for supervision to a qualified nurse.

#### SUMMARY

The public health physician has an interest in and responsibility for the promotion of greater efficiency in hospital procedures. This interest and responsibility can be best translated into action if the public health physician is empowered to carry out regulatory measures, as in a hospital licensing program. Given this authority, the public health physician may be an effective agent in the promotion of more efficient service.

In this program, emphasis is placed on the necessity for qualified and responsible personnel, and adequate facilities for providing care, with the hospital responsible for establishing details of procedure.

Within the hospital, the promotion of greater efficiency—that is, the “streamlining of technics”—is best done if there is coöperative planning by physicians, nurses, and hospital administrator.

## Practical Implications of the Epidemiology of the Diarrheal Diseases of the New-born

JAMES WATT, SURGEON, USPHS

*Division of Infectious Diseases, National Institute of Health and the Charity Hospital of Louisiana, New Orleans, La.*

THE diarrheal diseases constitute one of the major preventable causes of infant morbidity and mortality and a discussion of them illustrates how consideration of epidemiological features will serve to place first things first in nursery practice. The etiology of these disorders is only partially known at the present time, but both the outbreaks as well as the isolated cases may be divided into four groups on the basis of known and suspected etiological agents, (1) known pathogenic bacteria causing diarrheal disease, as *Shigellae* and *Salmonellae*, (2) bacteria whose etiological relation is suspected but not known as paracolon bacilli, pseudomonas, etc., (3) virus infections, and (4) parenteral infections.

An outstanding feature of reports on nursery diarrhea is the infrequency with which recognized pathogens have been isolated. This is probably due to two factors, first that infections with *Shigellae* and *Salmonellae* are much less common in infants than in older children and adults, due in part to limited opportunities for exposure, and second to the much greater difficulty of obtaining satisfactory cultures in very young children. Even with the selective media now commonly used, isolated colonies, essential for proper study, are

very difficult to obtain. A much smaller inoculum must be used and consequently there is a greater chance of missing the important organisms which may be present. That infection with members of these groups do occur with somewhat more frequency than is generally believed is shown by the fact that we have seen three primary infections with recognized pathogens in one premature nursery in the past year, two with *Shigellae* and one with a *Salmonella*.

A second point with regard to the diarrheal disorders of babies is the frequency with which some of the usually non-pathogenic organisms are encountered in abnormally large numbers in the stools of sick children. Paracolon bacilli, pseudomonas and others are quite frequently the predominating fecal flora. Evidence at this time is no more than suggestive as to the etiological relationship that these organisms may have, though most of them at one time or another have been given credit for an outbreak of nursery diarrhea by competent workers.

Chiefly because of uncertain bacteriological results, a virus has long been suspected as the cause of many of these disorders. Definitive results along these lines have not as yet been obtained, and conclusions must await further investi-

gations, but at least one group of workers<sup>1</sup> have isolated a filterable agent which appears to bear an etiological relationship to the diarrhea of the new-born.

Systemic and localized infections are also responsible for the symptom diarrhea in infants and older children. Since these are not primarily enteric in origin or spread, they will not be considered in this discussion but they, of course, must be a part of the differential diagnosis when individual cases or outbreaks are studied.

The recognized pathogens which cause diarrheal disorders are for the most part located in the intestines, escape to the outside only in feces, and are spread chiefly by person-to-person contact (in the case of infants a third party assists) of a sort which permits transfer of human excreta. Clinically and epidemiologically the diarrheal disorders from which such pathogens are not recovered are usually indistinguishable from the above. It is likely therefore that irrespective of the nature of the etiological agent, all are spread in the same manner.

Assuming that these are enteric infections, the problems of the diarrheal diseases of the new-born are: How do infectious agents get into the nursery, and how can their spread be prevented?

Usually the doctor, nurses, attendants, mothers, and visitors are suspected whenever an isolated infection appears in a nursery. They are the babies' only contacts with the outside world, and healthy carriers of enteric pathogens are common. These sources are easily minimized or eliminated by restricting the numbers of these contacts to the essential ones only, and insisting upon proper protective measures in the case of the essential few. These procedures are usually well carried out by most modern nurseries.

Very little attention, however, is paid to the babies themselves as potential

vectors. Of course, when a child is born unattended or in the home, it is usually not admitted to the general nursery. On the other hand, a child born in the delivery room after the usual pre-delivery preparations of the mother is customarily considered "clean" and admitted without restrictions.

That such an assumption is a dangerous one is shown by the following examples as seen in a premature nursery during the past year. A baby developed a bloody diarrhea on the third day after birth, and cultures of the stool revealed *Shigella sonnei* infection. The mother was investigated and was found to have the same infection with a history of mild diarrhea for three days before delivery. Post-mortem cultures on another child revealed *Salmonella typhimurium* infection, and similarly the mother was ill with an acute diarrheal disorder due to the same organism. This latter child was particularly dangerous in that it showed no signs of enteric disease until just before death on the fourth day of life.

Both of these cases were delivered after complete preparation and the babies were immediately isolated from the mothers. Infection must have taken place at the time of delivery in spite of the normal precautions.

Another *Shigella* infection was seen in the same nursery. The child began to have diarrhea 48 hours after delivery, and cultures were positive. The mother in this case was not seen until two weeks later as she had gone home by the time the diagnosis was made. She denied any diarrheal disorder and a single stool culture at that time was negative. The similarity of this case to the other one known to have acquired its infection at birth indicates that this too was probably acquired in the same manner.

These were recognized pathogens. If other organisms, usually non-pathogenic for adults, are dangerous for children,

it is certain that many children thus act as vectors of infection. The best of nursery care cannot prevent the introduction of infection in this manner. That is a matter for the obstetrical service. Nursery technique, however, must be such that these infections, when introduced, remain an individual rather than a group problem.

Stringent regulations have been devised for the operation of new-born and premature nurseries. The technique developed by the Dicks in Chicago, that of Hess and Lundeen, the regulations of the New York City Board of Health, and those of the Children's Bureau of the U. S. Department of Labor, to mention only a few, have all been published. These rules are all directed toward the ideal, namely maintenance in the nursery of a program of asepsis as good or better than that employed in the well conducted operating room. With this ideal, there can be no quarrel. At the same time it cannot be attained unless the nursery has been designed with this in mind (not just another room on the obstetrical or pediatric floor) and the staff is sufficiently trained and numerous to permit the carrying out of these procedures. Very few hospitals are so designed and staffed at this time. The program must therefore be a limited rather than an ideal one and directed toward obtaining maximum effect from each method used.

This means that each individual nursery must survey its assets as well as its defects and set up a procedure which is applicable to that particular situation. General rules can be no more than guides which assist in full utilization of those assets. There are, however, certain basic standards which cannot be undercut.

First of these is assuring the sterility of all mass modes of spread such as food, water, clothing, etc. This can be accomplished even with limited

facilities if a single individual is given complete charge of the preparation and delivery to the nursery of these supplies. This is particularly true of the preparation of food, water, and nipples. Such a person must have a well founded knowledge of aseptic technique and should be shown clearly and conclusively the reasons for each step in the adopted program. A few simple cultural procedures which can be done in any laboratory make impressive demonstrations of how improper handling at any point can result in massive contamination. When responsibility and accountability are vested in one person, situations similar to one recently observed by us will be avoided.

Cases of moderately severe diarrhea began to appear in a nursery which for some time had been free of these disorders. *Pseudomonas aeruginosa* (*B. pyocyaneus*) were found in large numbers in the stools of the sick infants, an organism rarely found in normal infants of this age group. The rapidity of spread and wide distribution of the cases indicated a common source of infection, so investigation of the food supply was undertaken at once. This revealed that in order to conserve materials the practice of autoclave sterilization of nipples in individual cellophane packets had been replaced by mass boiling and storage until needed, in supposedly sterile cans. The nipples, in a gauze bag were transferred immediately from boiling water to the containers, in the bottom of which was a gauze pad. This pad was dirty looking and culture showed a very heavy growth of *pyocyaneus* as well as colon bacilli. Immediate isolation of all cases and resumption of the individual sterilization procedure was ordered and no further cases developed.

While not proving an etiological relationship between the organism isolated and the cases, this did demonstrate gross contamination of the nipples

being used and was illustrative of what may occur in the absence of individual accountability. It was no one person's job to see to it that the cans were kept properly sterile. The nipples were boiled a sufficient time and were completely covered with water, but there was ample opportunity for introduction and maintenance of contamination in the cans since their care was a case of everybody's job being nobody's job. This was a streamlining procedure which did not work, not because it was inherently bad, but because proper safeguards were not used. Properly supervised, this method of nipple preparation could be entirely safe. It would always have the definite weakness, though, of possible mass contamination by relatively insignificant breaks in technique and therefore would not be recommended except under conditions of absolute necessity.

The second basic procedure is to keep the number of persons entering the nursery or having any direct or indirect contact with the children at an absolute minimum. This would include restriction of visitors to the obstetrical floor and absolute exclusion during the hours when the children are at the breast. In premature nurseries this is not usually a problem since these babies are best kept in strict isolation even from the mother, not simply to prevent infection but to minimize handling and permit other special procedures so frequently needed. Those who enter the nursery for any reason should be permitted to do so only after thoroughly cleaning the hands and putting on gowns or other special clothing. Enforcement of this rule should be the responsibility of the entire staff of the nursery unit, with the nursing supervisor having final authority. Internes, residents, and visiting staff members are usually the worst offenders in this particular regard, and in order to prevent unpleasant incidents,

they should be so informed in writing by the hospital director.

As we have seen, however, the staff and other postnatal contacts are not the only sources of infection in newborn nurseries. In fact, if protective devices are only moderately effective, they are probably infrequent sources of the original infection. The less emphasized and therefore more dangerous source is the child infected at birth. The previously mentioned case of *Salmonella typhimurium* infection is illustrative. The initial case died four days after birth and was not suspected of having an enteric infection at that time. It was only after finding that the cases of diarrhea which occurred in adjacent cribs were *Salmonella* infections and that the dead child's mother had an identical infection, that the true nature of the illness was suspected. Post-mortem cultures taken three weeks after death proved the nature of the first child's illness as well as the cause of death. This outbreak, together with the finding of single cases of *Shigella* infection under similar circumstances, indicates that each new admission should be considered a source of infection as well as a potential infectee.

Further investigation of the above outbreak was also instructive in that it indicated that the secondary cases resulted from a relatively direct transfer of the infection from one child to the others by the attendants in the course of their regular nursery duties. It is an excellent example of the point where breaks in technique are most likely to occur unless the personnel has been trained to think of all objects, animate and inanimate, as contaminant unless definitely known to be otherwise. It is not uncommon in nursery practice to see individuals who religiously wash their hands after diapering a baby or before feeding the child, go from one crib to the other, adjusting a blanket here, turning a child over there or just

patting another. When questioned, they are frequently entirely unaware of any break in technique. While such breaks may not be efficient spreaders of infection, they undoubtedly can and do prove effective at times. The rule for workers in the nursery must be to wash their hands with soap and water after any potentially unclean object has been handled. This will not prevent the introduction of infections acquired at birth, but it will effectively reduce the chances of such infection being spread to any other children.

In conclusion, the points which, from the epidemiological point of view,

should receive major, unrelenting attention are:

- 1. Insure sterility of all supplies, particularly those which are potential means of mass spread of infection.
- 2. Limit outside contacts in so far as possible, and see to it that necessary contacts are safe ones.
- 3. Adopt a technique in the nursery which emphasizes the danger of all children as potential sources of infection, no matter what may be their state of health. This latter rule, while quite likely the most important in most nurseries, is certainly the most neglected.

REFERENCE

1. Light, Jacob S., and Hodes, Horace L. Studies on Epidemic Diarrhea of the New-born. *A.J.P.H.*, 33, 12:1451 (Dec.), 1943.

Best Sellers in the Book Service for October

Local Health Units for the Nation. Haven Emerson, M.D. 1945.....	\$1.25
An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945.....	1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945 . . . . .	.35
Voluntary Health Agencies. An Interpretive Study. Selskar M. Gunn and Philip S. Platt, Ph.D., 1945 . . . . .	3.00
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed., 1945 . . . . .	4.00
Nursing in Prevention and Control of Tuberculosis. H. W. Hetherington, M.D., and Fannie Eshleman, R.N., 1945.....	3.00
Standard Methods for the Examination of Water and Sewage. 8th ed. 1936. Paper..	1.50

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

# Venereal Disease Epidemiology in Wartime\*

J. R. HELLER, JR., M.D.

*Medical Director, Chief, Venereal Disease Division, U. S. Public Health Service,  
Washington, D. C.*

THE basic principles of venereal disease epidemiology are essentially the same in wartime as they are in peacetime—infected persons must be found and treated, and additional persons to whom or for whom discovered infections have spread must be identified, traced, and treated.

Placing large numbers of people in uniform and under the jurisdiction of military and naval authority no more changes these fundamental principles of venereal disease epidemiology than it changes the fundamental principles of nutrition or sanitation. It does, however, create the urgent need for intensified application of these principles. It also affects the responsibility for, and the routine procedures related to, a large part of the venereal disease epidemiology job, as well as other aspects of venereal disease control.

Venereal disease control in wartime becomes the joint responsibility of the military and civilian health authorities. Because venereal disease among military personnel is acquired from and transmitted to the civilian population, the success of both the military and the civilian programs obviously requires coordination of efforts.

In 1940 when it became apparent that the United States might be drawn into World War II, military and civilian

health authorities were faced with the historical threat of a wartime increase of venereal disease. The U. S. Army, the U. S. Navy, and the U. S. Public Health Service promptly formulated a joint wartime program for the control of venereal diseases in areas where armed forces were concentrated; this program, which became known as the "eight point agreement," was adopted by the Conference of State and Territorial Health Officers in May, 1940. Prevention, early diagnosis, and early treatment of venereal disease by both the military and civilian health authorities, and the reporting of contacts by the military to civilian health authorities, were emphasized.

Routine blood testing had long been employed as one of the principal methods of syphilis case finding, and the Selective Service System, with the cooperation of the U. S. Public Health Service, and state health officers, decided to perform blood tests for syphilis as part of the general physical examination for selectees. By means of these tests, evidence of syphilis was discovered in more than 700,000 men. Prompt follow-up by civilian health authorities succeeded in placing under, or returning to, treatment the vast majority of these cases. On the basis of results of blood testing of the first two million selectees, it was estimated that the prevalence of syphilis in the United States was approximately three million.<sup>1</sup> Selective Service blood test-

\* Based on a paper presented before the Epidemiology Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 4, 1944.

ing was a historic first large scale attempt to reduce this reservoir of syphilis infection.

But reduction of the reservoir by blood testing and treating males, while in itself an extremely important step in venereal disease control, could not be expected to eliminate the spread of infection. The medical programs of the Army, Navy, and Coast Guard were designed to find early infections in their personnel and treat them until non-infectious; educational programs which emphasized prevention were conducted on a large scale. As was recognized in the "eight point agreement," venereal disease control programs in the armed forces, no matter how efficiently conducted, cannot be effective as long as infections exist in large numbers among both men and women in civilian communities. The success of venereal disease control programs among military personnel is therefore dependent upon effective case finding and case holding methods among civilians; the success of the civilian program, in turn, is furthered by efficient case finding and contact reporting by the armed forces. The reporting of alleged source and spread contacts by the military to civilian health authorities is a vital link between health jurisdictions.

In the early war period no standard form for the reporting of contacts by the military to civilian health authorities existed. Many of the forms in use in camps and stations were inadequate and methods of distribution were cumbersome. Early in 1942, the Office of the Surgeon General of the Army recognized the need for a standard method of reporting contacts and for an effective method of routing this information to civilian health authorities. With the collaboration of the U. S. Public Health Service, and drawing on the experience of Army medical officers and civilian health authorities, the Medical

Department of the U. S. Army substituted the Standard Form (Med. 140) for the heterogeneous collection of forms previously in use. Since that time, the U. S. Coast Guard and the U. S. Navy have adopted standard forms and standard methods of routing the information to civilian health authorities.

Civilian health authorities also mobilized to meet the threat of spreading infection to and from the civilian and military population. One problem facing these authorities was to examine, place under treatment, and hold to treatment until rendered non-infectious, girls, prostitute and otherwise, who were suspected of having a venereal disease and of infecting members of the armed forces. Follow-up workers became a necessity because of the shortage of public health nurses and medical-social workers trained in venereal disease epidemiology. Many health departments employed lay investigators recruited from a variety of fields and trained for this purpose. Health officers have been most enthusiastic about the accomplishments of these workers who have made an outstanding contribution to the venereal disease control program in wartime.

In addition to their value in providing health officers with data regarding alleged infected persons, contact reports of the armed forces serve an extremely useful purpose in providing accurate information to Army, Navy, and civilian health and law enforcement authorities regarding the places—such as taverns, rooming houses, and other sites—where prostitutes and flagrantly promiscuous amateurs were being encountered most frequently. This enables more intelligent and effective enforcement of laws and conduct of programs directed against the commercial exploitation of sex. Planned programs of prevention and redirection through recreation facilities, welfare services, and



other social approaches to venereal disease control were aided by the information provided through contact reporting.

Much credit is due the Social Protection Division of the Federal Security Agency for the general assistance it has provided health and law enforcement agencies and the armed services in this important aspect of control. Similar credit is due to the American Social Hygiene Association for its investigative, educational, and consultation efforts in both medical, and social protection activities.

In general, it may be said that in the operation of the joint military-civilian venereal disease control program, contact reporting is a major function of the military, and follow-up of these contacts is the major function of the civilian health authorities. In an effort to obtain data which could be used to evaluate the effectiveness of the joint program and as a guide to future effort, civilian health authorities were requested to report back to the armed forces on the results of investigation. U. S. Public Health Service Regional Tabulating Units are cooperating with Army Service Commands in preparing these data.

The armed forces are constantly endeavoring to improve the quality of the information submitted on contact forms. Toward this end, arbitrary categories have been set up in several Army Service Commands and the Navy Bureau of Medicine and Surgery within which contact reports can be classified. Some of these classifications are rather elaborate, such as complete name and address, complete name and incomplete address with the place of encounter specified, etc. In one method of classification which is relatively easy to use, forms are classified as providing: (1) sufficient information for possible location of the contact, (2) sufficient information to provide a possible lead for the location of the alleged contact or

to point out places which appear to facilitate transmission of venereal disease, (3) insufficient information for referral for any practical purpose.

Data from Army Service Commands indicate that the Army has succeeded to a great extent in reducing the number of reports containing apparently inadequate information and in increasing the proportion of forms containing apparently adequate information. For example, in one Service Command the percentage of contact forms containing information apparently insufficient for practical use was lower in 1943 (36 per cent) than 1942 (44 per cent). Similarly the percentage of forms containing "sufficient information for possible location of the contact" increased in the same period from 29 per cent to 41 per cent. Although the percentage improvement for white soldiers (63 per cent) was greater than for colored soldiers (26 per cent), colored soldiers give better and more complete information than white soldiers, according to the arbitrary classifications and according to the results of investigation by civilian health authorities. In another Service Command, colored soldiers gave more specific information, according to the arbitrary classifications, than did whites in two states, but gave less specific information in two other states.

Some Service Commands prepare monthly tabulations showing the percentage of results of investigation returned by civilian health departments within an arbitrarily defined time period, for instance 60 days. It is not unusual for Service Command-Liaison Officers to notify civilian health officers of cases on which the results of investigation have not been returned within this specified time period. The tabulations prepared for Service Commands indicate a higher percentage of cases not returned by civilian health authorities to the Service Commands within the 60 day period from date of report (42

per cent) than is indicated by tabulations prepared by civilian State and Regional Tabulating Units (5 per cent), where the time period is measured from the date of receipt of the form. Two obvious reasons present themselves: (1) a delay in getting the contact information into the hands of the local health departments responsible for investigation of the cases, and (2) failure to route the completed investigation back to the Service Command in which it originated. Fortunately in most cases contact forms are routed in an efficient manner.

Tabulations prepared for Service Commands indicate that approximately 18 per cent of the Army contacts reported are located within the arbitrary 60 day period and 27 per cent are eventually located regardless of the time period in which the case was closed. Tabulations prepared by civilian tabulating units indicate a much higher percentage of location of contacts of the armed forces (an average of 36 per cent, ranging from 22 per cent in one area to 41 per cent in another). Both sets of figures indicate that approximately half of the persons located are diagnosed as being infected (54 per cent Service Command tabulations and 51 per cent civilian tabulations). Both sets of figures indicate that approximately one-third of the persons located are brought to treatment for the first time as the result of the investigation (38 per cent Service Command tabulations and 35 per cent civilian tabulations).

Data from areas in which comparative tabulations are available indicate that contacts of the armed forces comprise approximately one-half of the non-familial contacts reported to civilian health authorities for investigation (average 46 per cent, ranging from 29 per cent in one area to 61 per cent in another). A higher percentage of civilian contacts (43 per cent) was

located than of contacts of the armed forces (37 per cent). A slightly greater percentage (21 per cent) of civilian contacts reported was found to be infected than of contacts of the armed forces (19 per cent). However, the percentage of cases reported which were brought to treatment for the first time as a result of investigation was the same for both groups—13 per cent for contacts of the armed forces, and 13 per cent for civilian non-familial contacts.

In these same areas in the semi-annual period, July–December, 1943, 1,884 new infections were brought to treatment as a result of investigations of the armed forces' contacts and 2,140 as a result of investigation of non-familial contacts reported by civilian health authorities. These figures indicate the important rôle played by contact reporting of the armed forces in the venereal disease epidemiologic program during the present war effort. The fact that almost half of the encounters between members of the armed forces and civilians occurred outside of the state in which the patient reported for treatment, added to the magnitude of the task. If civilian health authorities apply themselves to the task of interviewing new patients for contacts with the same enthusiasm and thoroughness with which infected members of the military personnel are interviewed, we should approach more nearly and more rapidly our goal of breaking the chain of infection.

One of the greatest problems facing the health officer has been the difficulty of holding syphilis patients to treatment until they are permanently non-infectious. Under the older routine schedule, treatment of a patient with 20 injections of an arsenical and 20 injections of heavy metal extended over a period of approximately 40 weeks. Lapsing from treatment became the rule rather than the exception. Data collected by Regional and State Tabulating Units

indicated that only one-fourth of the patients admitted with early syphilis to state clinics were held to treatment until minimum protective therapy had been received.

Early results of newer and more rapid types of therapy for syphilis indicated that patients could be rendered permanently non-infectious much more quickly than under the older routine schedule of therapy. However, the administration of most of these new treatments requires hospitalization. Through funds made available by the Lanham Act and administered by the Federal Works Agency, an opportunity was provided to acquire liquidated National Youth Administration and Civilian Conservation Corps camps and similar readily available facilities and to convert them to special hospitals for the rapid treatment of syphilis and gonorrhea. There are now in operation 11 federally-operated and 52 state-operated Rapid Treatment Centers, with a bed capacity of approximately 6,000. Numerous cases are also being hospitalized and treated in general hospitals.

Several forms of intensive treatment are being used, but the advent of penicillin opens new vistas for the venereal disease control program. At present penicillin is available for the treatment of sulfa-resistant gonorrhea and for the treatment of syphilis in the first stages. Its place in the treatment of gonorrhea is evidently established, and preliminary figures regarding its effectiveness in the treatment of syphilis offer promise that the ideal quick treatment for syphilis may at last be near.

The participation of the armed forces in the joint military-civilian venereal disease control program continues even after the separation of personnel from the armed forces. Neither the Army nor the Navy will release back to civilian life personnel with venereal disease in an infectious stage.

Both the Army and the Navy are making provisions for the referral to civilian health authorities of complete information regarding the diagnosis and treatment of persons who have been treated but for whom further treatment or observation is considered necessary. Arrangements have been made by the Surgeon General of the U. S. Army and the Surgeon General of the U. S. Public Health Service whereby soldiers will receive a routine blood test as part of their separation physical examinations. All soldiers found to have syphilis in an infectious stage will be retained in the Army until they have received treatment sufficient to render them temporarily non-infectious. Information regarding soldiers whose blood tests at the time of separation indicate that hidden non-infectious syphilis may be present, and soldiers who have not completed the prescribed course of therapy in the Army will be referred to local health officers for follow-up so that uninterrupted treatment may be assured veterans who have not completed their course of treatment, and so that treatment may be instituted for veterans whose infections had not previously been discovered. Home communities will be protected against the spread of infection from returning veterans and at the same time the veterans will be protected against late ravages of syphilis.

Thus we approach the post-war period with every assurance that as a result of prompt, persistent, joint efforts on the part of both military and civilian authorities during the wartime venereal disease emergency, the venereal disease problem will not be out of hand, that continued and concerted action can succeed in breaking the chain of infection, and that the reduction in the incidence of venereal disease which was noted prior to the outbreak of hostilities can be resumed. To accomplish these ends, effective substitutes must be

TABLE 1

*Semiannual Report of Contact Tracing on New Untreated Clinic Admissions in Six Selected Areas Served by Regional Tabulating Units*

*July-December, 1943*

Diagnosis of New Cases	Area	Number of New Cases Admitted to Clinic	Number of Contacts Reported	Number of Contacts Reported per New Case	Brought to Treatment	Under Treatment Prior to Investigation	Total under Treatment	Epidemiologic Index
		(a)	(b)	(b)/(a)	(c)	(d)	(e)	(e)/(a)
Primary and Secondary Syphilis	I	354	960	2.71	110	41	151	0.43
	II	119	225	1.89	25	13	38	0.32
	III	194	246	1.26	37	23	60	0.31
	IV	380	417	1.10	57	61	118	0.31
	V	346	361	1.04	43	60	103	0.30
	VI	512	241	0.47	31	44	75	0.15
Early Latent Syphilis	I	480	533	1.11	48	17	65	0.14
	II	420	340	0.80	52	16	68	0.16
	III	387	312	0.80	27	38	65	0.17
	IV	594	473	0.80	40	94	134	0.23
	V	1,395	1,545	1.11	153	253	406	0.29
	VI	3,004	623	0.21	77	150	227	0.08
Other Syphilis	I	1,306	450	0.34	44	8	52	0.04
	II	531	337	0.63	36	11	47	0.09
	III	530	484	0.91	78	27	105	0.20
	IV	1,190	618	0.52	71	99	170	0.14
	V	1,664	953	0.57	128	123	251	0.15
	VI	2,282	440	0.19	56	89	145	0.06
Gonorrhea	I	3,006	2,944	0.98	642	76	718	0.24
	II	*	*	*	*	*	*	*
	III	1,432	953	0.66	151	67	218	0.15
	IV	1,510	1,072	0.71	97	112	209	0.14
	V	3,956	1,987	0.50	253	125	378	0.10
	VI	3,052	1,037	0.34	124	62	186	0.06
Other Venereal Diseases	I	336	198	0.59	10	4	14	0.04
	II	*	*	*	*	*	*	*
	III	25	11	0.44	2	1	3	0.12
	IV	109	59	0.54	5	4	9	0.08
	V	256	145	0.57	8	1	9	0.04
	VI	211	72	0.34	6	1	7	0.03

\* No data available

Source: Clinic Population Reports and Semiannual Reports of Diagnosis of Infected Contacts, July-December, 1943—prepared by Chicago and Washington, D. C., Regional Tabulating Units.

found for the two effective wartime epidemiologic mechanisms, namely, Selective Service blood testing, and contact reporting by the armed forces to help break chains of infection. As a substitute for Selective Service blood testing, civilian health authorities must utilize more extensively routine blood testing among industrial workers, routine blood testing by hospitals and other medical agencies, routine blood testing of applicants for insurance, and premarital and prenatal blood testing, requirements for which should be broadened and strengthened. Private physicians must continue their efforts to look for and find venereal diseases

in the active and latent stages, and to report contacts, spread as well as source. Contact investigation offers the most effective method of finding cases in the earliest and most infectious stages. Interviewing for contacts in private physicians' offices, in venereal disease clinics, in Rapid Treatment Centers, and in hospitals is vital. Prompt and effective follow-up is necessary, of course, but cannot succeed without accurate and complete contact reporting.

A tabulation has been prepared for six selected areas served by regional tabulating units in which the number of contacts reported by patients is com-

pared with the number of patients admitted. The ratio of contacts found infected to the original patients naming them, which is called an "epidemiologic index," was calculated. Since it may be assumed that each patient should have at least one infected contact, the theoretical minimum index is 1. The index may, of course, be greater than one, and the larger the index the more effective the epidemiologic program may be considered. For the six areas for which data are available, the index for primary and secondary syphilis averages about one-third (ranging from 0.15 to 0.43). It is also noted that the index varies directly with the ratio of contacts reported per new case which averages about one and one-quarter (range 0.5 and 2.7). This means that every 100 patients admitted with primary or secondary syphilis reported 125 contacts, from which 31 infections were located. Table 1 indicates clearly the important rôle interviewing for contacts plays in the case finding program. The highest ratio of contacts (including familial) per patient was 2.7, and the

highest epidemiologic index was 0.43. These are the figures for routine contact tracing in the present venereal disease control program.

A special study in epidemiology based on contacts reported by 251 patients with early syphilis receiving intensive treatment at Cook County Hospital in Chicago, results of which have been made available to the author by the Illinois Social Hygiene League, gives a ratio of 5.8 contacts per patient and an epidemiologic index of 2.2. These figures indicate the contribution which can be made by skilled contact interviewing and persistent follow-up. It is not difficult to visualize the effects on the venereal disease problem of a contact investigating program which would result in the location of two infected cases for every admission to Rapid Treatment Centers, clinics, hospitals, and private physicians' offices. Obviously more productive interviewing is the prerequisite.

#### REFERENCE

1. Parran, Thomas, and Vonderlehr, R. A. *Plain Words about Venereal Disease*. New York: Reynal & Hitchcock, 1941, p. 211.

# Outbreak of Sodium Nitrite Poisoning

MORRIS GREENBERG, M.D., WILLIAM B. BIRNKRANT, M.D.,  
AND JOSEPH J. SCHIFTNER

*Bureau of Preventable Diseases and the Bureau of Food and Drugs,  
City Department of Health, New York, N. Y.*

SODIUM nitrite is manufactured chiefly for its use in the dye industry. It is also employed as an anti-corrosive in anti-freeze mixtures. For many years it has been used either alone or mixed with saltpeter in the curing of meat in order to bring out the red color, and as a preservative. The Bureau of Animal Industry of the Department of Agriculture allows nitrites to be used in curing meat, provided the finished product contains not more than 200 p.p.m. The salt is sold freely on the market. Heat used in cooking destroys nitrites, but it cannot be depended upon, since the amounts destroyed vary with the degree of heat and the length of cooking. Saltpeter, or sodium nitrate, is the salt more commonly used in curing meat. U.S.P. saltpeter is 99.5 per cent pure, but commercial saltpeter frequently has a large admixture of sodium nitrite. It is surprising that in spite of the ready availability of sodium nitrite, cases of food poisoning caused by the ingestion of this salt in food are unusual occurrences. No mention of such food poisoning is made in the standard texts of Jordan, Tanner, or Dack. The report of an outbreak of nitrite poisoning is therefore of interest.

On September 25, 1944, a report was received by the Department of Health from a hospital in lower New York City that 11 old men had been admitted to the hospital with cyanosis and shock. The investigation indicated that all of them had become ill that morning be-

tween 7:15 and 10 A.M. In each instance illness occurred within 5 to 30 minutes after eating breakfast in a cafeteria on Chatham Square. All were between 60 and 80 years of age and all were of the derelict type, living in cheap rooming houses on the Bowery. Seven of those ill lived in the same rooming house; the other four lived in different rooming houses of the same type, and were unacquainted with each other.

The clinical picture was similar in all. Within 5 to 30 minutes after breakfast, the involved individuals became dizzy, felt weak, and complained of abdominal cramps. Eight of them vomited and all had diarrhea. Five of them became unconscious shortly after onset of symptoms. All were admitted to the hospital by ambulance.

What impressed the admitting physician was the picture of shock that the patients presented. They had subnormal temperatures, cold extremities, and low blood pressures. In addition, all had cyanosis. In one patient, the cyanosis was over the entire body; in the rest it was chiefly of the lips, nose, ears, fingers, and toes. Blood counts and urine examinations were normal for the most part. They were treated for shock with bed rest, heat, and stimulant drugs. They also received gastric lavage and the more cyanotic patients got oxygen therapy. All but one patient recovered. This man, age 82, died the following morning. Autopsy revealed bronchopneumonia. The only other abnormal finding was a diffuse

mahogany brown discoloration of the organs.

In view of the cyanosis, the possibility of poisoning with one of the coal tar derivatives was thought of, and specimens of blood were obtained from each of the patients. These were examined spectroscopically.\* Absorption bands for methemoglobin were found in all. The men were closely questioned about the use of drugs prior to their illness. All denied such use.

The restaurant in which the men ate is located in a poor section of the city and caters to men of very restricted means. It does not rate high in sanitation, lighting, or adequate kitchen equipment.

The men had become ill shortly after eating breakfast. All but one had eaten oatmeal, rolls, and coffee. One ate oatmeal only. The investigation was therefore directed toward this food. It was prepared by the cook at 5 A.M. and allowed to boil for  $2\frac{1}{2}$  to 3 hours. The dry oatmeal was obtained on the market in 5 lb. paper cartons. Four gallons of water were added, and a handful of salt. A similar handful of this when actually weighed equalled 101 gm. The mixture was stirred well before and during cooking and was kept simmering on the stove until all servings had been made. There were 6 gallons in the finished product and about 125 people were served, which made a serving equal to about 6 oz. There seemed no reason to suspect the dry oatmeal which was purchased in the usual commercial carton. The water used was from the city supply. The salt used for cooking was in a can near the stove. It had a faint yellow color. The cook stated that he filled the can from a supply on a shelf. There were two containers on this shelf, one filled

with what appeared to be ordinary white-colored salt and the other filled with a yellowish looking salt. The owner stated that the latter was salt-peter, which he used in curing meat. Both containers and the can were embargoed and examined in the chemical laboratory of the Department of Health. The substance which looked like salt did actually turn out to be sodium chloride. The material in the other container and in the can was curing salt, of which 92 per cent was sodium nitrite. The can had been filled from this container by mistake. None of the oatmeal was left, so that no determination was possible of the amount of nitrite ingested in the oatmeal by each individual. Since about 125 portions of oatmeal had been served, inquiry was made at the various hospitals serving the area and at rooming houses in the vicinity to determine if any other men had become ill. No evidence was obtained of any more cases. It appeared improbable that the oatmeal was the sole source of poisoning since it had been eaten by 125 men and only 11 had become ill. It occurred to us that the same error might have been made in filling saltshakers as in filling the can. Accordingly, we obtained 17 saltshakers used in the restaurant. The salt from 10 of them was pooled and chemical examination revealed 0.074 per cent of sodium nitrite. We requested examination of the contents of each of the remaining 7 saltshakers separately. One contained 0.137 per cent of sodium nitrite, 2 had only faint traces, and 4 had only sodium chloride.

As soon as we became aware of the possibility of nitrite poisoning, a chemical examination of the blood of the men in the hospital was requested. A pooled sample of the blood from the ten survivors was dialyzed through a collodion membrane. The dialysate was evaporated to a concentrated form with

\* We are indebted to Dr. Alexander O. Gettler of the Chief Medical Examiner's Office for the spectroscopic determinations and for the chemical examination of blood.

low heat, and tested for the presence of nitrates and nitrites. The results indicated the presence of nitrites.

Since none of the cooked oatmeal was available, a batch was cooked for  $2\frac{1}{2}$  hours, using  $1\frac{1}{4}$  lb. of oatmeal, 25 gm. of the "salt" from the can and 1 gallon of water. The ingredients used were in the same proportion and the cooking for the same length of time as in the original batch. A sample of the mixture contained 0.6 per cent of sodium nitrite before cooking and 0.1 per cent of sodium nitrite after cooking.\* In the usual portion of 6 oz., there would be 0.18 gm. (about  $2\frac{1}{2}$  grains) of sodium nitrite.

#### COMMENT

The U. S. Pharmacopeia gives the average pharmacologic dose of sodium nitrite as 0.060 gm. or 1 grain. The British Pharmacopeia gives the dose as 0.03 to 0.12 gm. ( $\frac{1}{2}$  to 2 grains). Soma Weiss and his coworkers conducted several studies on the effect of sodium nitrite on normal subjects. In one of these studies they established that a dose of 3 grains caused low blood pressure, pallor, sweating, nausea, dizziness, and finally loss of consciousness, when the subjects were tilted from a lying position to an angle of  $75^\circ$ .<sup>1</sup> The addition of a small amount of sodium nitrite to the portion of cooked oatmeal eaten would bring the total dose up to the toxic level.

As we reconstruct the picture, a number of individuals in the restaurant ate the oatmeal either without the addition of salt or with the addition of sodium chloride from the saltshakers that contained no nitrites. The 11 men who became ill must have used one of the few saltshakers that contained consider-

able admixture of sodium nitrite, bringing the intake up to toxic levels.

A search of the literature yields only a few reports of cases of nitrite poisoning. Most of these are in individuals, a few in family groups of two or three. The clinical picture in all of them is so much alike that one seems to be reading the same case history repeatedly. Onset of symptoms is dramatically sudden, very soon after eating the contaminated food. Nausea and vomiting are common, but the characteristic picture is one of cyanosis, particularly of the fingertips, nose, and ears, and the rapid loss of consciousness, frequently leading to death. The spectroscopic examination of the blood gives an absorption band characteristic of methemoglobin and at autopsy the only positive finding is a chocolate colored discoloration of the organs.

In most of the reported cases the nitrite was used in food, as in our report, under the mistaken notion that it was table salt. Padberg and Martin<sup>2</sup> report poisoning which caused death in three men who prepared a stew with salt obtained from a manufacturing plant. Examination of the stomach contents of the dead men as well as of the beef stew showed the presence of nitrites.

McQuiston<sup>3</sup> also reports on the death of three persons, a man, woman, and child, who used salt in cooking and in a saltshaker, which the man obtained from the plant where he worked. Analysis of the remaining food and of the salt in the saltshaker as well as of the stomach washings, showed large quantities of sodium nitrite.

A similar occurrence in three members of a family who used sodium nitrite in cooking is reported by Ruegg.<sup>4</sup> Here, too, the salt was brought home from the factory under the impression that it was sodium chloride. All three recovered after treatment.

\* Andrew J. Pensa, chemist, Department of Health, performed the chemical determinations of the oatmeal as well as of the salts in the containers and saltshakers.



H. Huziter-Kramer<sup>5</sup> reported sodium nitrite poisoning in two small groups. In one of these, a father, mother, and daughter became ill soon after a meal in which sodium nitrite, brought home from the factory by the father, was mistakenly used for salt. Typical symptoms of vomiting, cyanosis, and loss of consciousness occurred and the patients were removed to a hospital. Nitrites were found in the stomach, and methemoglobin in the blood. All made recoveries. In the other group, two men became ill after eating pickled cabbage brought to the factory by a fellow worker, which was liberally sprinkled with salt from the factory. Both men died, and sodium nitrite was recovered from the stomach as well as in the remains of the lunch.

Four cases described by Musso<sup>6</sup> were given sodium nitrite in a drugstore in Algeria in a purgative lemonade. The native druggist took the nitrite from a bottle labeled "sodium tartrate." All four died. A similar error in which a druggist gave two infants aged 3 months and 2 months sodium nitrite instead of sodium citrate as a cathartic caused illness in both and death in one of them.<sup>7</sup>

Single cases of sodium nitrite poisoning have been reported by Palmer,<sup>8</sup> Arbuckle and Thies,<sup>9</sup> Naidu and Rao,<sup>10</sup> and Molitaris.<sup>11</sup> All were fatal cases. A fatal case of poisoning with potassium nitrite is reported by Farinand and Woltz.<sup>12</sup>

The uniformity of clinical symptomatology and the high fatality rate is striking in the reports from the literature. The chances of death depend largely, in all probability, on the

amount of nitrites ingested. In the outbreak reported here only one death occurred among 11 cases. According to our calculations, most of the men took a little more than the pharmacologic dose, so that although they became seriously ill, they made an eventual recovery.

#### SUMMARY

1. An outbreak is reported in which 11 men were poisoned by eating oatmeal in which sodium nitrite was used instead of table salt, and on which, in all probability, additional sodium nitrite was added from saltshakers.

2. Symptoms began immediately after the meal and consisted of nausea, vomiting, cyanosis, shock, and loss of consciousness. One death occurred.

3. Methemoglobin was found in the serum of each case and nitrites were recovered from a pooled specimen of the bloods.

#### REFERENCES

1. Stead, E. A., Jr., Kunkel, P., and Weiss, S. Effect of Pitressin in Circulatory Collapse Induced by Sodium Nitrite. *J. Clin. Investigation*, 18:673-678 (Nov.), 1939.
2. Padberg, L. E., and Martin, T. Three Fatal Cases of Poisoning. *J.A.M.A.*, 113:1733 (Nov. 4), 1939.
3. McQuiston, T. A. C. Fatal Poisoning by Sodium Nitrite. *Lancet*, 2:1153-1154 (Nov. 14), 1936.
4. Ruegg, H. Nitrite Poisoning. *Schweiz. med. Wchschr.*, 16, 2:809-810 (Aug. 31), 1935.
5. Huziter-Kramer, H. Sodium Nitrite Poisoning. *Sammlung von Vergiftungsfallen*, 7:15-16, 1936.
6. Musso, L. Four Cases of Fatal Poisoning with Sodium Nitrite. *J. de pharm. et chim.*, 4:345-360, 1926.
7. Manicattide, M. Two Cases of Poisoning by Sodium Nitrite. *Bull. Soc. de pediat. de Paris*, 5:379-380, 1932.
8. Palmer, A. A. Fatal Poisoning by Sodium Nitrite. *M. J. Australia*, 2:113-114 (July 22), 1933.
9. Arbuckle, H. B., and Thies, O. J., Jr. Fatal Poisoning with Sodium Nitrite. *Indust. & Eng. Chem., News Ed.*, 2:202 (July 10), 1933.
10. Naidu, S. R., and Rao, P. V. Case of Nitrite Poisoning. *Brit. M. J.*, 1:1300 (June 27), 1936.
11. Molitaris, H. Nitrite Poisoning. *Vierteljahresschr. gericht. med.*, 43, 2nd suppl.:289-297, 1912.
12. Farinand, M., and Woltz, H. Fatal Case of Potassium Nitrite Poisoning. *Bull. Soc. path. exot.*, 32:234-236, 1939.

# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35

November, 1945

Number 11

C.-E. A. WINSLOW, Dr.P.H., *Editor*

LEONA BAUMGARTNER, M.D., *Associate Editor*

ARTHUR P. MILLER, C.E., *Associate Editor*

MAZŮCK P. RAVENEL, M.D., *Editor Emeritus*

MARTIN FROBISHER, JR., Sc.D., *Associate Editor*

JAMES E. PERKINS, M.D., *Associate Editor*

AUGUSTA JAY, *Editorial Associate*

### *Editorial Board*

REGINALD M. ATWATER, M.D.

*Chairman, and Managing Editor*

IRA V. HISCOCK, Sc.D.

KENNETH F. MAXCY, M.D.

HENRY E. MELENEY, M.D.

ALTON S. POPE, M.D.

C.-E. A. WINSLOW, Dr.P.H.

## "SCRUB TYPHUS"

AS the second in our series of Special Review Articles, we are fortunate in obtaining for the present issue of the JOURNAL, a summary of Army studies on the mite-borne typhus of the Pacific areas by Blake and Maxcy, and their colleagues. The problems involved are not directly significant in the continental United States; but they will be important for us as a nation, since we shall certainly be responsible for a long time to come for the administration of strategic bases in the affected regions. The public health expert, at home, must have at least an intelligent comprehension of the major tropical diseases and the methods for their control.

The particular malady now under consideration is of considerable historical interest. We are accustomed to date our knowledge of the spread of infection by insects, mites, and ticks, from the Texas fever studies of Smith and Kilborne in 1893; but according to Ashburn and Craig, fever due to a mite was mentioned in Chinese writings more than a thousand years ago; and the Japanese name Tsutsugamushi fever carries the same connotation. A historical analysis of these origins would be of fascinating interest.

The studies reported by Blake and his colleagues were made chiefly in New Guinea under the auspices of the U. S. Army Typhus Commission and the Board for the Control of Influenza and other Epidemic Diseases; and dealt primarily with the condition known commonly as "scrub typhus" in that area. The investigators find no significant differences between the scrub typhus of New Guinea and the tsutsugamushi disease of Japan. Clinical variations are slight. Both infections appear to be caused by strains of *Rickettsia orientalis*; both show a specific reaction with the Proteus strain OXK, but not with OX<sub>19</sub>; both are apparently spread from various wild rodents by the ticks of the genus *Trombicula*, or closely related forms.

No success has yet been attained in the preparation of vaccines or sera. Vaccines made from suspensions of *Rickettsia prowazeki* confer no protection.

Perhaps the most interesting phase of this study is its field epidemiology. The Commission demonstrated that infection occurred during temporary bivouacs, or

in the first week or so of the occupation of new camps, in areas where kunai grass fields offered conditions for mite harborage; and these conclusions were checked by studies of the nymphs of mites obtained from boot collections and from indigenous rodent hosts. These observations naturally indicate practical control procedures involving cutting and burning of scrub, avoidance of sleeping on the ground, and personal cleanliness. Under field conditions—where these ideals cannot be attained—reliance must be placed on impregnation of clothing and socks with effective anti-mite fluids, such as dimethyl or dibutyl phthalate. Unfortunately, the protection thus provided is lost in the course of a week or two; and the miracle-working DDT is not effective against mites.

## THE TEST OF KING SOLOMON

**I**T will be remembered that when each of two women claimed the same child as her own, Solomon suggested that the child be cut in half, and recognized as the true mother the one who refused this eminently practical arrangement. The child of school age is today the victim of a somewhat similar conflict between the Board of Health and the Board of Education.

For this problem there is no simple solution. Classroom instruction is clearly the duty of the school. Certain aspects of health protection fall clearly within the province of the health officer. In between, are such functions as school medical inspection and school nursing which are sometimes performed by one agency, sometimes by the other. When two functional agencies converge on a single person or group of persons, there is no way of resolving the difficulty except through an ordered program of coöperation.

In the way of general overhead planning for such coördination; considerable progress has been made. On the federal level, the U. S. Public Health Service, the Office of Education, the Children's Bureau, and the War Food Administration coöperated in two regional conferences, one in Chicago in November, 1934, and one in Atlanta in January, 1944. Their objective was to stimulate representatives of departments of health and of education toward better coördination; and definite results were attained as a result of these conferences in several states.

On the state level, Illinois and Kansas have organized Joint Committees on School Health, with the aid of C. E. Turner as their consultant. In Illinois, the State Department of Public Health, the State Office of Public Instruction, and the State Department of Registration and Education formed a joint council with active subcommittees, which have prepared two valuable reports on basic plans for health programs in the schools and in teacher training institutions. The fact that Illinois has adopted a definite policy of placing a trained health educator in every local full-time health department is an important element in the state program.

North Carolina established, several years ago, a school coördinating service composed of representatives of the Department of Education and Department of Public Health to demonstrate coördinated school programs. For a time the Coördinating Service tried using a team of highly trained personnel (a doctor, nurse, nutritionist, etc.) to visit counties and demonstrate excellent school health service. The length of time for which they remained in a county was not, however, sufficient to bring about any marked changes in county practices. The Service has now embarked on a program for a trained health educator in each

county to work in the community on the long-time job of improving health education. This program has been aided by the General Education Board.

In Georgia, a coördinating committee composed of three members of the State Department of Health, three members of the State Department of Education, and one representative of the Teaching Training Council has been formed. Only recently has it been possible to employ any staff. A workshop for teachers was planned for the past summer.

In Mississippi, coöperation is carried a step further, by the use of a joint staff under the coördinate direction of a representative of the State Department of Health and a representative of the State Department of Education. This would hardly be a sound administrative arrangement for general application but seems to work well in the case of the personalities concerned. The staff provides in-service training throughout the state in the carrying on of school and community health education programs. It has actively promoted the employment of trained local health educators, responsible to the local health officer, but supported by county and city boards of education as well as by state and local boards of health. This Mississippi program has also been aided by the General Education Board.

An even more radical step has been taken in Indiana through the appointment of a common Director of Health Education for the Department of Health and the Department of Education. Mr. Frank Stafford was the director of health and physical education for the two departments for eight years before going to the Federal Office of Education. The position is now held by Mr. Yoho. He is paid by the Department of Health, but serves both departments. Both departments share in the provision of educational materials and supplies. To further the coördination in local areas, competent personnel are being recruited and trained to serve as local health education coördinators. For the past two summers the State Health Department has planned a workshop with the coöperation of the State University. Local health departments participate in the workshop with local teachers attending. Stipends are paid by the State Department of Health.

In Tennessee, a Director of Health Education serves the Departments of Health, and of Education, the State University, and the Tennessee Valley Authority in its work in Tennessee. Each of the four organizations contributes to his salary.

An important contribution on the local level has been made by the W. K. Kellogg Foundation in stimulating school and community Health Service Projects. This movement grew out of attempts in Michigan to interest high school seniors in health services such as nursing, laboratory work, dental hygiene, and the like. Grants for such projects in secondary schools have been made by the Foundation in 22 states.

Not all the programs to which we have referred have proved successful. Most of them have, however, contributed to a better understanding of the problems involved; and some have reported notable achievement. Results can be satisfactory only when there is a competent health educator at the heart of the organization and when his or her efforts have the real support of the officials and the agencies concerned. The need for some machinery of this sort is, however, clear. When the health officer or the teacher or the nurse says, "Oh, yes, we have fine coöperation. I know to whom to go when there is any trouble, and we always get it straightened out"—then you know that no one has ever visualized what a school health program should be. No real mother is revealed by Solomon's

test—for a true school health program is something quite different. It is positive, not negative. It involves continuing coöperative planning for meeting all the health needs of the child, not avoidance of friction. No community has begun to do its duty until it has set up some sort of a coördinating group, including representatives of the health department, the school doctors, the school nurses, the physical educators and the classroom teachers and supervisors, to meet at regular stated intervals and to promote and continuously develop a really complete program for the physical and emotional health of the Americans of the future.

## THE SEEING EYE IN TUBERCULOSIS CONTROL

THE war has had its inevitable effect on the seriousness of the problem of tuberculosis; but that effect has not been serious in countries like the United States and Great Britain. It has, however, even in such fortunate areas, checked previous declines and caused slight increases.<sup>1</sup> We have still a job to do; and we know how to do it. The traditional tuberculosis program, based on prompt detection of clinical symptoms (aided by general improvement in economic status) has cut the rates for our large American cities from 400 per 100,000 a century ago to 40 or less. The control of this final residuum must depend on the detection of preclinical disease by the use of modern scientific methods which serve the diagnostician as the Alsatian does the blind man.

It is most important that this almost miraculous procedure should be used effectively and economically. When the new procedures were first introduced, we all started off on comprehensive x-raying of elementary school children. Educational authorities in some parts of the country still advocate this procedure; but experience has shown that the practical results are so meager—and have so little practical significance—that routine examinations at this age are wasteful of money and of even more valuable expert time. Tuberculin testing of entering children may be useful in locating family foci of infection; and at the close of school life x-raying is desirable. Between these periods, such examinations should be limited to contacts and to children who exhibit suspicious pulmonary symptoms.

Certain small communities have initiated mass x-ray surveys covering their entire population. Such studies are of significant value as research procedures but are not practical—probably not justifiable—as parts of our general administrative health program. If the seeing eye is to lead us most directly to our goal—the elimination of tuberculosis—it should be applied, first and foremost, to the following groups of our population:

1. Persons with suspicious pulmonary symptoms
2. Contacts with known cases of tuberculosis (as defined by Edwards, persons in intimate and prolonged or repeated association with an open case of chronic pulmonary tuberculosis showing positive sputum or evidence of cavitation by x-ray)
3. General hospital admissions, a class which has been strangely neglected in the past
4. Members of racial groups which—for genetic or economic reasons—show abnormally high incidence of tuberculosis
5. Workers in trades exposed to silica dust

The relative importance of the last two categories will obviously vary in different localities. Either a silicosis group or a racial group may furnish the most promising point of attack (next to contacts) in a given community. Medical

students, nurses, and inmates of hospitals for the insane also deserve special attention.

In formulating administrative policies, we must always balance theoretical ideals by consideration of problems of practical convenience. High school children and industrial workers furnish unique opportunities for the actual conduct of an x-raying program; and the industrial group gives us access to both of the last two categories of promising prospects.

It is for this reason that industrial x-ray programs are likely to play a major rôle in tuberculosis control during the next decade. The Connecticut State Tuberculosis Commission has embarked on an extensive campaign along this line. Another excellent program has recently been inaugurated by the Onondaga Health Association centering at Syracuse, N. Y. In the year 1944, 9,120 workers were x-rayed, using miniature films, followed in suspicious cases by standard large x-rays. Thirty-three cases of active tuberculosis were revealed, of which about one-half required hospitalization; the rest, home treatment. If the ratio holds for the city in general, there are nearly 200 more cases in Syracuse industries awaiting discovery. On such a basis, the Syracuse Health Department and the Onondaga Health Association estimate that, for every 1,000 employees x-rayed, 2 to 4 active cases will be found and that the amount of money needed to pay for the hospitalization will be \$2,400 to \$4,800.

The health administrator should keep in close touch (through the N.T.A., the A.P.H.A., and the U.S.P.H.S.) with advances in both technical and administrative procedures, which are coming fast. Morgan, of the University of Chicago, has described a useful device for an automatic control of exposure in photo-fluography.<sup>2</sup> Palmer,<sup>3</sup> of the U.S.P.H.S. has presented an analysis of an important factor in the interpretation of the films obtained; and we present in the present issue of the JOURNAL a more extensive study of this problem by Christie and Peterson.<sup>4</sup> In the east-central states (between Maryland, North Carolina, Arkansas, and Iowa), roentgenograms reveal an abnormally high proportion of pulmonary calcification (28 per cent in Kentucky as compared with 6 per cent in Oregon). The prevalence of this phenomenon is not closely correlated with tuberculosis rates. The Palmer and Christie studies indicate that it is correlated with reaction to histoplasmin tests and suggest that in tuberculin-negative individuals a high proportion of calcification may be due to subclinical infection with *Histoplasma* organisms.

From an administrative standpoint, the description of New York City's tuberculosis program,<sup>5</sup> published by Edwards and Robins two years ago, still constitutes an excellent manual of procedure. More recently, we have presented in the columns of this JOURNAL an account by Graves and Cole<sup>6</sup> of the administrative program in operation in Memphis and Shelby County, Tennessee. Dr. Graves has worked out practical coöperation between the Health Department, the Sanatorium, the Public Health nursing staff of the community, and the local tuberculosis society, which is worthy of emulation. Admirable relationships have been established with the local medical profession, and pneumothorax cases are freely exchanged between the doctor's office and the clinic, according to changes in income. It is of interest to note that the age group 16 to 35 showed an incidence of 5.5 per cent positives and yielded 48.6 per cent of all cases found; while the 36 to 55 year old group showed 11.6 per cent positives and yielded 32.4 per cent of all cases found. The group under 16 gave only 1.9 per cent positive results. It is of particular interest to note that contacts and suspects yielded 8.0 per cent

positive results, while all other examinations (high school students, medical students, prenatal cases, etc.) yielded only 2.9 per cent. (It should be noted that the Graves classification of "positives" is more inclusive than that suggested by Edwards, comprising all x-rays interpreted as indicating chronic, active, or arrested tuberculosis.) - The cost of the tuberculosis program to the Health Department (less than 2.5 per cent of its total budget) was \$1.50 per x-ray film and \$39.72 for each active case found. With economies made possible by current improvements in technique, the wider extension of the case finding program to industrial groups and to the Negro population should be readily possible.

## REFERENCES

1. Doull, J. A. Tuberculosis Mortality in England and Certain Other Countries During the Present War. *A.J.P.H.*, 35:783 (Aug.), 1945.
2. Morgan, R. H. The Automatic Control of Exposure on Photofluorography. *Pub. Health Rep.*, 58:1533 (Oct. 15), 1943.
3. Palmer, C. E. Non-tuberculous Pulmonary Calcification and Sensitivity to Histoplasmin. *Pub. Health Rep.*, 60:513 (May 11), 1945.
4. Christie, Amos, M.D., and Peterson, J. C., M.D. Pulmonary Calcification in Negative Reactors to Tuberculin. *A.J.P.H.*, 35:1131 (Nov.), 1945.
5. Edwards, H. R., and Robins, A. B. Simplified Procedures in Tuberculosis Control. *A.J.P.H.*, 33:517 (May), 1943.
6. Graves, L. M., and Cole, F. H. Memphis and Shelby County Tuberculosis Control Programs. *A.J.P.H.*, 35:934 (Sept.), 1945.

## LETTER TO THE EDITOR

## TO THE EDITOR:

I should like to make a few comments on the excellent report of Paris R. Eastman on Infant Mortality in Relation to Month of Birth published in the September 1945 issue of the Journal. This study which relates infant deaths to the month of birth presents results that are of considerably more interest and value than one based on monthly infant mortality rates as conventionally computed. Contrary to general belief, the "infant mortality rate" ordinarily computed by relating infant deaths occurring during a month to the births occurring in the same month is not a probability figure at all because deaths of infants under 1 year occurring during a particular month do not all arise from the infants born during the same month. Therefore, for precise analysis of the infant mortality problem, the numerator and denominator of the infant mortality rate should be brought into correspondence

by a method such as that employed by Eastman. As shown by our study entitled The Effect of Changing Birth Rates on the Infant Mortality Rate (Vital Statistics—*Special Reports*, vol. 19, No. 2), even the conventionally computed *annual* infant mortality rate may lead to erroneous interpretations during periods of changing birth rates such as the present. Because of the large seasonal swings in births, monthly infant mortality rates should always be corrected if probability values are to be obtained.

The author states in his paper that greater refinement in determining the month of birth in his study was not possible since the Census Bureau did not give the exact age (i.e., in days) at death. This statement gives the impression, which I am sure that the author did not mean to convey, that it is necessary to tabulate every infant death by age to the nearest day. Since

the greatest differential in rate occurs during the first few weeks of life, it would be sufficient to tabulate neonatal deaths only by a more detailed subdivision of age of less than a month. The Bureau of the Census published such a tabulation each year in the annual reports which permits a fairly precise allocation of infant deaths to the month of birth. However, these tabulations are for total infant deaths only, and not by cause of death.

The author appears to make quite a point of the lack of data in a suitable form for the study. While the publication of the tabulation of infant deaths by cause of death, by month of death, by age was discontinued in 1939, the data were tabulated. In this connection it may be of interest to the reader of the Journal to know that the Bureau of the Census tabulates a large

volume of statistics each year but because of the physical impossibility of publishing all of the tabulated data, only a relatively small portion find their way into the publications. The fact that certain tables have not been published does not mean that the data are not available. In most cases, the Bureau will supply the information upon request without charge. If considerable work is involved in preparing a special table, a nominal fee is charged. If there is sufficient demand for any particular unpublished tabulation, one can be sure that it will be made available to the public in published form at the earliest opportunity.

HALBERT L. DUNN, M.D.  
*Chief, Vital Statistics Division*  
Bureau of the Census,  
Washington, D. C.



## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.*  
*All books reviewed in these columns may be purchased through the Book Service.*

**A Manual of the Aspergilli**—By Charles Thom and Kenneth B. Raper. Baltimore: Williams & Wilkins, 1945. 373 pp., 76 figs., 7 colored plates. Price, \$7.00.

This *Manual* has been prepared to provide the worker who is interested in aspergilli with a means for their identification. At the same time, all forms described or mentioned in the literature are enumerated and their proper place in the group is indicated.

It is based on a study of the cultures now in the Northern Regional Research Laboratory of the U. S. Department of Agriculture, Peoria, Ill. This collection of cultures was developed under the guidance of the senior author and owes much of its completeness to the care given it by Dr. Margaret B. Church who collaborated with Dr. Thom in a previous monographic treatment of the same group of molds in a book entitled "The Aspergilli."

The book begins with a historical introduction and discussion of the classifications proposed for the aspergilli and with an explanation of their morphology, variation, methods of cultivation and preservation. The key which permits recognition of the group to which any unknown culture belongs precedes 14 chapters devoted to a discussion of the 14 groups recognized. The groups are indicated by the name of a distinctive species as follows: *Aspergillus clavatus*, *A. glaucus*, *A. fumigatus*, *A. nidulans*, *A. ustus*, *A. flavipes*, *A. versicolor*, *A. terreus*, *A. candidus*, *A. niger*, *A. wentii*, *A. tamarii*, *A. flavus*, *A. bryzae* and *A. ochraceus*. The third part of the book covers

reference material, including a classified as well as a general bibliography. Check lists of described genera, species, and varieties are also given. The *Manual* will be classed as indispensable by all students of this group of molds.

ROBERT S. BREED

**Medical Nursing**—By Amy Frances Brown, R.N., M.S.N. Philadelphia: Saunders, 1945. 579 pp., 153 illus. Price, \$2.75.

This is an ambitious book, covering the aspects of nursing care of some two hundred conditions in medical patients. It serves as an authoritative reference, with excellent bibliographies, to diseases of the respiratory, digestive, circulatory, and nervous systems, with shorter sections devoted to nursing in communicable diseases. Assistance in writing many of the chapters—such as nursing in allergy and fever therapy—has been secured from specialists, and up-to-date material is included related to nursing in nutritional diseases.

It is inevitable that such an encyclopedic presentation should be uneven. The first four chapters are by far the best. They deal with the general principles of nursing the critically ill, the long-time ill, and medical emergencies. The section on communicable diseases is incomplete, many of the virus-caused diseases being omitted. It seems unfortunate that poliomyelitis was among these.

There is sufficient basic and essential information to make Miss Brown's "compendium" a useful reference for staff use in public health agencies. It does not, however, stress prevention,

home care, or family health instruction. It is for the most part centered in the hospital situation.

DOROTHY DEMING

*Men Under Stress*—By Roy R. Grinker, Lt. Col., M.C., and John P. Spiegel, Major, M.C. Philadelphia: Blakiston, 1945. 484 pp. Price, \$5.00.

*Men Under Stress* is an exceptionally well written and well organized book on the psychoneuroses precipitated by the stress associated with military life and aerial combat. The material for it was obtained through the personal experience of the authors in the treatment of many cases in the combat area and at a convalescent hospital in this country. The men who were selected for service in the Air Corp are described, the environment to which they were subjected is presented and their reactions both to combat and upon return home are given. The authors in conclusion generalize as to the applications for civilian psychiatry and the general social implications.

The neurotic responses are grouped under six types of reactions: "operational fatigue," passive dependent states, psychosomatic states, guilt and depression, aggressive and hostile reactions, and psychotic-like states. The dynamics of each type of reaction are discussed and each is illustrated with well chosen and exceptionally well abstracted case histories. The vividness of these case abstracts is enhanced by the inclusion of verbatim productions of the patient while under the influence of sodium pentothal. Various methods of treatment are described and their results evaluated. Methods particularly useful to the flight surgeon and general practitioner are indicated, as well as the more specialized procedures of the psychiatrist.

The book is written within the frame of reference of psychoanalytic theory. The style and terminology are

such that the intelligent layman as well as the physician should be able to read and enjoy one of the most significant books to come out of the war.

JAMES M. CUNNINGHAM

*Animal Colony Maintenance*—By Edmond J. Farris, F. G. Carnochan, C. N. W. Cumming, Sidney Farber, Carl G. Hartman, Frederick B. Hutt, J. K. Loosli, Clarence A. Mills, and Herbert L. Ratcliffe. New York: N. Y. Academy of Sciences, 1945. 126 pp. Price, \$1.50.

This book consists of papers presented before a conference on Animal Colony Maintenance, held by the Section of Biology of the New York Academy of Sciences. The first paper stresses the importance of reducing variability in stocks of experimental animals by as strict inbreeding as is possible without loss of vigor and good reproduction: seemingly minor variations and mutations may have far-reaching effects upon physiological traits. Perhaps the most unique feature of the symposium is a paper summarizing information on the physiology of estrus and mating, and giving practical instructions for making accurately timed matings of a variety of laboratory and domestic animals. Two papers summarize large amounts of information on nutritional requirements and infectious diseases of laboratory animals. A paper on the influence of environmental temperatures on warm-blooded animals reviews the physiological changes attendant upon high temperatures and emphasizes the importance of maintaining animal colonies at uniform temperature if experimental results are to be uniform and reproducible. Two papers on the finances of animal colony maintenance, (1) in a large university, and (2) by a large commercial breeder, concludes the symposium. Most of the papers are fully documented with references to the original studies.

PAUL A. MOODY

**Methods for Determining Lead in Air and in Biological Materials—**  
*A report prepared by the Subcommittee on Chemical Methods of the Committee on Ventilation and Atmospheric Pollution of the A.P.H.A. New York: A.P.H.A., 1944. 41 pp. Price, \$.75.*

This booklet was written by Professor J. Cholak of the Kettering Laboratory of Applied Physiology of the University of Cincinnati. It reflects the vast experience which that laboratory has had in the estimation of lead when present in minute quantities.

Several dithizone methods and the use of the spectrograph and the polarograph are described in sufficient detail to permit an understanding of the principles underlying each method and to enable the inexperienced analyst to appreciate the difficulties encountered in each of the various procedures. Some of the procedures can be followed by such analysts so that successful results may be obtained after some trials. It is perhaps unfortunate that the titration method of Wilkens, Willoughby, and others has been described rather than that of Horwitt and Cowgill, since the latter method does not require the use of relatively unstable dithizone solution as a standard.

The sections on Collection and Preparation of Samples for Analysis are excellent for biological materials but inadequate for air sampling—only about 8 per cent of the text in these sections deals with air-borne samples. The reason given for the low efficiency of the impinger for the collection of fumes and fine dusts is not that usually given. An absorption train for the collection of lead in air is not generally used by industrial hygienists because of the low sampling rate and probable inefficiency of absorption. The more recent procedure of collection on filter paper is not mentioned. However, the analytical methods are equally ap-

plicable to samples collected from air and of biological materials, with the possible exception that it is probably unnecessary to analyze samples of air-borne lead-containing material with the high degree of accuracy obtainable with the use of the spectrograph.

Despite the weakness of the section on collection of air-borne samples, this booklet is a valuable addition to the library of the industrial hygienist. The "selected bibliography" is sufficiently complete so that additional details on any of the analytical methods can be obtained by those who are interested.

SAMUEL MOSKOWITZ

**Fluorine in Dental Public Health**  
*—A Symposium by Frederick S. McKay, D.D.S., H. Trendley Dean, D.D.S., Wallace D. Armstrong, M.S., Ph.D., M.D., Basil G. Bibby, B.D.S., Ph.D., D.M.D., David B. Ast, D.D.S., M.P.H. New York: New York Institute of Clinical Oral Pathology, 1945. 62 pp. Free from publisher.*

The five papers published in this 62 page booklet tell the very interesting story of the relation of fluorine and the teeth. Beginning in 1908, each major development is traced without a great deal of detail.

McKay cites the evidence indicating that fluorine was responsible for the aberrations of the teeth now known as dental fluorosis. Dean reveals how the relationship between dental caries and relatively low amounts of fluorine in the potable waters was found. His study of the permanent teeth of children in the eight communities near Chicago having waters of varying amounts of fluorine will probably remain a classic in dental epidemiology.

An important chapter is added by Armstrong when he shows that the fluorine content of the enamel of carious teeth is only 62 per cent of that of sound teeth. Bibby's paper shows that caries experience rates in

young permanent teeth calcified on fluorine-free waters can be depressed by multiple applications of fluorine solutions after the teeth have erupted. Using the facts presented, Ast outlines the controlled experiment needed to demonstrate that dental decay can be materially reduced in large masses of the population—at a cost of 5 cents per capita.

A complete bibliography of all research in fluorine permits the reader to refer to original data of other workers as well as those taking part in the Symposium. WALTER J. PELTON

**Housing for the United States After the War**—By *National Association of Housing Officials*. (2nd ed.) Chicago: National Association of Housing Officials, 1944. 64 pp. Price, \$.50.

The Postwar Housing Committee of the National Association of Housing Officials outline in this book their conception of the major elements upon which a housing policy for the United States must be based. The objective must be that of providing adequate housing for all the people. The use of both public and private enterprise in the proper proportion is urged as essential in order to secure such adequate housing. The problem is discussed for both urban and rural communities. Regulations for new and existing housing, planning for new housing in suitable neighborhood environments, governmental assistance for land acquisition in order to clear slums, and protecting existing neighborhoods, are some of the important urban problems that are discussed in some detail. Housing for rural areas, however, must be planned in relation to land use and with a realization that there are differences between urban and rural housing. The types and designs of farm housing, the farming community, and the necessity for financing rural home building in economic farm areas, are discussed.

Housing is fundamentally a local problem arising from local conditions. Facts objectively collected are essential to an understanding of the problem and as a basis for an intelligent program. Leadership at the local level is required to stimulate coördinated action by all those agencies whose individual programs provide answers to various phases of the problem. The local building, planning, enforcement, welfare, public housing, zoning, and taxing problems, as they affect the overall housing situation, must be stimulated, coördinated, and rationalized on the basis of the actualities in each specific community. This book should be in the hands of all public health officials having a personal concern for the physical elements which support community life, one of which is shelter.

ALFRED H. FLETCHER

**Jurisprudence for Nurses** — By *Carl Scheffel, M.D., in collaboration with Eleanor McGarvah, R.N.* (3rd ed.) New York: Lakeside Publishing Co., 1945. 264 pp. Price, \$3.00.

After reading the third edition of this well known reference book for nurses, the reviewer wonders how any nurse dares practise without the knowledge of her legal status so clearly described by the authors!

This new edition covers all the problems familiar to nurses in home, hospital, and clinic services, such as responsibility in relation to wills, slander, criminal negligence, contracts, and bearing witness, and adds new material on recent court decisions, the latest medical and nurse practice acts (Canada included), and up-to-the-minute information regarding registration for the returning nurse-veteran. Questions and answers for the use of teachers are appended.

It seems unfortunate to this reviewer that more is not said regarding the nurse's status under civil service or

**Methods for Determining Lead in Air and in Biological Materials—**  
*A report prepared by the Subcommittee on Chemical Methods of the Committee on Ventilation and Atmospheric Pollution of the Industrial Hygiene Section of the A.P.H.A. New York: A.P.H.A., 1944. 41 pp. Price, \$75.*

This booklet was written by Professor J. Cholak of the Kettering Laboratory of Applied Physiology of the University of Cincinnati. It reflects the vast experience which that laboratory has had in the estimation of lead when present in minute quantities.

Several dithizone methods and the use of the spectrograph and the polarograph are described in sufficient detail to permit an understanding of the principles underlying each method and to enable the inexperienced analyst to appreciate the difficulties encountered in each of the various procedures. Some of the procedures can be followed by such analysts so that successful results may be obtained after some trials. It is perhaps unfortunate that the titration method of Wilkens, Willoughby, and others has been described rather than that of Horwitt and Cowgill, since the latter method does not require the use of relatively unstable dithizone solution as a standard.

The sections on Collection and Preparation of Samples for Analysis are excellent for biological materials but inadequate for air sampling—only about 8 per cent of the text in these sections deals with air-borne samples. The reason given for the low efficiency of the impinger for the collection of fumes and fine dusts is not that usually given. An absorption train for the collection of lead in air is not generally used by industrial hygienists because of the low sampling rate and probable inefficiency of absorption. The more recent procedure of collection on filter paper is not mentioned. However, the analytical methods are equally ap-

plicable to samples collected from air and of biological materials, with the possible exception that it is probably unnecessary to analyze samples of air-borne lead-containing material with the high degree of accuracy obtainable with the use of the spectrograph.

Despite the weakness of the section on collection of air-borne samples, this booklet is a valuable addition to the library of the industrial hygienist. The "selected bibliography" is sufficiently complete so that additional details on any of the analytical methods can be obtained by those who are interested.

SAMUEL MOSKOWITZ

**Fluorine in Dental Public Health—**  
*A Symposium by Frederick S. McKay, D.D.S., H. Trendley Dean, D.D.S., Wallace D. Armstrong, M.S., Ph.D., M.D., Basil G. Bibby, B.D.S., Ph.D., D.M.D., David B. Ast, D.D.S., M.P.H. New York: New York Institute of Clinical Oral Pathology, 1945. 62 pp. Free from publisher.*

The five papers published in this 62 page booklet tell the very interesting story of the relation of fluorine and the teeth. Beginning in 1908, each major development is traced without a great deal of detail.

McKay cites the evidence indicating that fluorine was responsible for the aberrations of the teeth now known as dental fluorosis. Dean reveals how the relationship between dental caries and relatively low amounts of fluorine in the potable waters was found. His study of the permanent teeth of children in the eight communities near Chicago having waters of varying amounts of fluorine will probably remain a classic in dental epidemiology.

An important chapter is added by Armstrong when he shows that the fluorine content of the enamel of carious teeth is only 62 per cent of that of sound teeth. Bibby's paper shows that caries experience rates in

young permanent teeth calcified on fluorine-free waters can be depressed by multiple applications of fluorine solutions after the teeth have erupted. Using the facts presented, Ast outlines the controlled experiment needed to demonstrate that dental decay can be materially reduced in large masses of the population—at a cost of 5 cents per capita.

A complete bibliography of all research in fluorine permits the reader to refer to original data of other workers as well as those taking part in the Symposium. WALTER J. PELTON

**Housing for the United States After the War**—By *National Association of Housing Officials*. (2nd ed.) Chicago: *National Association of Housing Officials*, 1944. 64 pp. Price, \$.50.

The Postwar Housing Committee of the National Association of Housing Officials outline in this book their conception of the major elements upon which a housing policy for the United States must be based. The objective must be that of providing adequate housing for all the people. The use of both public and private enterprise in the proper proportion is urged as essential in order to secure such adequate housing. The problem is discussed for both urban and rural communities. Regulations for new and existing housing, planning for new housing in suitable neighborhood environments, governmental assistance for land acquisition in order to clear slums, and protecting existing neighborhoods, are some of the important urban problems that are discussed in some detail. Housing for rural areas, however, must be planned in relation to land use and with a realization that there are differences between urban and rural housing. The types and designs of farm housing, the farming community, and the necessity for financing rural home building in economic farm areas, are discussed.

Housing is fundamentally a local problem arising from local conditions. Facts objectively collected are essential to an understanding of the problem and as a basis for an intelligent program. Leadership at the local level is required to stimulate coördinated action by all those agencies whose individual programs provide answers to various phases of the problem. The local building, planning, enforcement, welfare, public housing, zoning, and taxing problems, as they affect the overall housing situation, must be stimulated, coördinated, and rationalized on the basis of the actualities in each specific community. This book should be in the hands of all public health officials having a personal concern for the physical elements which support community life, one of which is shelter.

ALFRED H. FLETCHER

**Jurisprudence for Nurses** — By *Carl Scheffell, M.D., in collaboration with Eleanor McGarvah, R.N.* (3rd ed.) New York: *Lakeside Publishing Co.*, 1945. 264 pp. Price, \$3.00.

After reading the third edition of this well known reference book for nurses, the reviewer wonders how any nurse dares practise without the knowledge of her legal status so clearly described by the authors!

This new edition covers all the problems familiar to nurses in home, hospital, and clinic services, such as responsibility in relation to wills, slander, criminal negligence, contracts, and bearing witness, and adds new material on recent court decisions, the latest medical and nurse practice acts (Canada included), and up-to-the-minute information regarding registration for the returning nurse-veteran. Questions and answers for the use of teachers are appended.

It seems unfortunate to this reviewer that more is not said regarding the nurse's status under civil service or

merit systems. That section which refers to the problems in federal employment is also meager when one considers the greatly increased staffs employed by Uncle Sam.

The index is too general to be helpful. Otherwise it is a valuable reference book.

DOROTHY DEMING

**Handbook of Practical Bacteriology**—By T. J. Mackie, M.D., and J. E. McCartney, M.D. (7th ed.) Baltimore: Williams & Wilkins, 1945. 720 pp. Price, \$5.00.

The new edition of this well known book carries on the tradition of previous editions. As the title indicates, it is not a textbook but is devoted mainly to techniques and contains only a synopsis of basic principles. There are 3 main parts, of which the first, Introductory, consists of 2 chapters dealing with The General Biology of Microorganisms, and Immunity in Relation to Practical Bacteriology. Part II contains concise practical details on microscopy, cultivation, staining, animal handling, immunological techniques, and a chapter combining techniques of milk and water contamination, disinfectant testing, and collection and forwarding of specimens for bacteriological examination, all according to British requirements. Part III comprises the latter half of the book and deals with specific pathogenic bacteria and their relation to disease, and with pathogenic rickettsia, fungi, protozoa, and viruses. Technical details on filtration are also given.

The book is naturally British in viewpoint, and in several details is quite at variance with American ideas. For example, it is stated that if diphtheria organisms "present all the characters of the *gravis* type, virulence is generally assumed without resorting to an animal test." Such an assumption in the United States would lead to very grave error.

An appendix is added, "for the in-

clusion of new contributions to bacteriological knowledge and technique which had assumed special importance after the text had already been revised." An attempt has been made to link this appendix, containing several new techniques, to the old main text by appropriate references. The book is almost without illustrative matter, a half dozen or so simple line drawings and a few tables serving for the purpose. It is well bound and printed, contains a useful index, and should prove of value on the reference shelf of the laboratory bacteriologist.

MARTIN FROBISHER, JR.

**Disinfection and Sterilization**—By Ernest C. McCulloch, D.V.M. (2nd ed) Philadelphia: Lea and Febiger, 1945. 472 pp. Illus. Price, \$6.50.

The second edition of this book has been completely rewritten. The chapters on heat, particularly pasteurization, have been condensed so that only pertinent material is included. A brief summary of the sulphonamides and the antibiotics of microbial origin is presented.

Admittedly the literature on disinfectants is very conflicting but the author in his chapter on mercurials could have clarified this group for his reader. The citing of literature, without explanations of results, is apt to be confusing.

The review of the quaternary ammonium compounds is fragmentary. The statement "Zephiran is the only cationic detergent which has been actively recommended as a bactericide" is rather unfair to the other quaternary ammonium compounds that are on the market. The author separates the quaternary ammonium salts into two groups, namely the synthetic detergents, Cephiran, Roccal, etc., and the quaternary ammonium salts, although all these compounds belong in the same group.

The author has, however, presented a

very complete review of the field of disinfection and sterilization. Each chapter carries a well selected list of references. The book should be accessible to all bacteriologists and public health workers. W. L. MALLMANN

**Pulmonary Tuberculosis in the Adult**—By Max Pinner, M.D. *Springfield, Ill.: Thomas, 1945. 579 pp. Price, \$7.50.*

A "must" book for tuberculosis workers is Dr. Max Pinner's *Pulmonary Tuberculosis in the Adult*. This work maintains the high standard set by Rich in his *Pathogenesis of Tuberculosis*, and supplements it by providing valuable clinical material and judgment. It resembles Rich's book in quoting extensively from the European literature and in its critical attitude toward many conclusions and dogmas. Illustrating the spirit of the volume, the author refers to one problem as "open to sterile speculation and probably fertile research."

This reviewer is struck and pleased by Dr. Pinner's treatment of the bibliography. He not only gives extensive chapter references, but succinctly states each author's main theme and frequently evaluates the work. To be sure, some 125 pages are consumed by these references, but presented in this way they are far more valuable to the average reader than when merely listed by name and title.

Dr. Pinner holds that the degree of the skin reaction to tuberculin is no measure of the existing immunity, but insists that experimenters should prove by means other than the skin reaction that "desensitized" animals are not allergic.

An excellent chapter deals with phthysiogenetic principles under the subheadings of morphological and causal phthysiogenesis. The term "epituberculosis" should be discarded because of its varied connotations. A

helpful distinction is made between miliary and non-miliary hematogenous tuberculosis. Sarcoidosis is still considered by this author to be a form of non-caseating tuberculosis. The great importance of the bronchial factor, in cavitation and in the healing of cavities is emphasized.

Under diagnosis, the author stresses the importance of the availability of free-x-ray examinations of the chest. He advocates premarital chest x-rays.

The physiological principles of respiration and the physiological and pathological principles of pulmonary collapse are discussed in a modern way. The author appears not to be an extremist in advocacy of collapse therapy or of any particular type of the latter, though preference is given to pneumothorax, with pneumolysis when indicated, and to thoracoplasty. He judiciously remarks that "non-clinical aspects favoring particularly frequent use of collapse therapy are: slight appreciation of (or lack of experience with) results of adequate bedrest, seeing as the main aim of treatment the conversion of sputum and not cure of the individual patient, and lack of prolonged follow-up observations."

Dr. Pinner discusses in his closing chapter epidemiological principles. He shows that our morbidity data in tuberculosis are woefully incomplete, that fatality rates cannot be accurately estimated, that even mortality rates are subject to many flaws. Tuberculosis in a virgin population follows a definite course, being at first like an acute infectious disease, later more chronic and more productive, with the age incidence shifting slowly to the higher age groups. The factor of heredity is given more prominence than in most writings.

Dr. Pinner succeeds unusually well in accomplishing his purpose which, in his own words, is "to create understanding, to form rational and consistent attitudes and approaches to the problem



as a whole, to provide the basically necessary foundations on which the practical work should proceed."

JOHN H. KORNIS

**Constitution and Disease: *Applied Constitutional Pathology***—By Julius Bauer, M.D. (2nd ed.) New York: Grune & Stratton, 1945. 247 pp. Price, \$4.00.

The objective of this book is a very worthy one. There is a great need for more attention to be paid to the constitutional factors in disease. Emphasis for the most part has been placed by investigators on the external factors which affect health and disease, and Dr. Bauer makes a plea for more attention to the constitutional factors.

Although a great mass of information has been compiled in this little volume, and even though the conclusions of the book may eventually be shown to be correct, they have not been established by the argument of the book. Many of the statements are justified by the

citation of individual cases. The principles of sampling and of the use of controls have been seriously disregarded. When facts fail, the voice of authority has been called upon to justify statements. Even though the author is highly critical of the theories of others, he seems perfectly willing to accept without documentary facts the theory of variations in genetic constitution to explain away a large number of medical problems.

It is a pity that this book is not an adequately documented treatise on the constitutional aspects of medicine, the need for which is so obvious.

DAVID D. RUTSTEIN

**Voluntary Health Agencies. An Interpretive Study**—By Selskar M. Gunn and Philip S. Platt. New York: Ronald Press, 1945. 364 pp. Price, \$3.00.

See Editorial "A Challenge to the Voluntary Health Agency" in the October issue of the JOURNAL, page 1070.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY. WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Crank Gets Jolt**—In England, a learned justice has decided that anti-vivisection societies are not established "for charitable purposes only," and that the attainment of their objectives would be injurious to public welfare. Hence contributions to them are not exempt from tax. Wonder what stand our federal taxing authorities take in this matter?

ANON. Anti-vivisection Societies and the Income Tax. Brit. M. J. 4417:291 (Sept. 1), 1945.

**Only Cancer of the Lung Increases**—The outlook for the control of cancer is definitely promising. So

begins a brief summary of the heartening statistics which give reason to the belief that real gains are being made.

ANON. Encouraging Trends in Cancer Mortality. Stat. Bull., Met. Life Ins. Co. 26, 7:1 (July), 1945.

**Epidemiologic Study**—A boy coming to camp with incubating poliomyelitis was placed in a cabin with six others. About two weeks later virus was recovered from five of the six and a second case developed in one of these five. The study confirmed the fact that virus may be present in the intestinal tract for some time before as well as during and after the attack.

BROWN, G. C., *et al.* Rapid Development of Carrier State and Detection of Poliomyelitis Virus. *J.A.M.A.* 129, 2:121 (Sept. 8), 1945.

"Most Remarkable Therapeutic Agent"—Rules are made to be bent, if not broken, so the proscription against including strictly medical papers in this sanctuary of public hygiene will be pushed gently ajar just far enough to let me whisper to you that I found a lot of pleasure in reading this authoritative free-for-all on penicillin. You will too. Dr. Keefer has an outstanding paper on the same topic in the August issue of *American Journal of Medical Sciences*—I may as well be hung for a sheep as a lamb.

CATTELL, MCK., *et al.* Conferénces on Therapy: Penicillin. *New York State J. Med.* 45, 17:1875 (Sept. 1), 1945.

Workers Who Get Sick—Rates for digestive and non-respiratory-non-digestive diseases continue to rise, both rates for 1945 (first quarter) having never been equalled or exceeded during the past ten years. There was less influenza.

GAFAFER, W. M. Sickness Absenteeism among Male and Female Industrial Workers during 1944 and among Males during the First Quarter of 1945 with a Note on Absence Duration 1941-1944. *Pub. Health Rep.* 60, 36:1037 (Sept. 7), 1945.

Road to Perdition—For three years this Georgia county has had a prepaid plan for medical care at a cost of \$50 per family. The claim is made that it is good for the doctors as well as the beneficiaries. Though it may be berated by some as "socialized medicine," to those who participate in it, it is regarded as plain horse sense, says the writer. In New Mexico another experiment is based on medical services through three clinics—and *that* seems to be working, too.

GLOVER, K. Better Health for Country Folks (and) HARDING, T. S. In the Moun-

tains of New Mexico. *Survey Graphic.* 34, 9:372 (Sept.), 1945.

Susceptibility of New-born to Pertussis—In this study a group of mothers were given pertussis vaccine during the last months of pregnancy, another group served as controls. Placental transfer of pertussis antibodies was found to occur, and further, that the higher the level in the mother, the more nearly does the titer of the baby approach her own.

KENDRICK, P., *et al.* Immunity Response to Mothers and Babies to Injections of Pertussis Vaccine During Pregnancy. *Am. J. Dis. Child.* 70, 1:25 (July), 1945.

Pilot Study on Fluorides—About 300 children received topical applications of sodium fluoride to the teeth on the left side of the mouth, a comparable group received no treatment. Initial caries attacks continued for two years to be 40 per cent less for the treated than on the untreated side of the children's mouths.

KNUTSON, J. W., and ARMSTRONG, W. D. The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. II. Report of Findings for Second Study Year. *Pub. Health Rep.* 60, 37:1085 (Sept. 14), 1945.

One for the Record—In smaller doses than American practice has set, British-made whooping cough vaccine was found to have no protective value in one Oxford (England) study.

McFARLAN, A. M., *et al.* Trial of Whooping-Cough Vaccine in City and Residential Nursery Group. *Brit. M. J.* 4415:205 (Aug. 18), 1945.

Sanitation in the Raw—Clearing debris, disposing of refuse and corpses, supplying potable water, controlling prostitutes were just a few of the tough sanitary and medical jobs encountered after the liberation of Caen—pronounced "Kah," remember? It is to be hoped that our returning medical

major will have equally entertaining and revealing stories to tell.

RAISTRICK, S. F. Medical Problems of the Rehabilitation of Caen. *Public Health*. 58, 12:135 (Sept.), 1945.

**And What Price Contentment?**—Not the costliness, but the actual economy of good housing in social, as well as financial dividends, is argued in this stimulating paper. Infant mortality, tuberculosis, diseases of childhood, home accidents, delinquency rates are all measurable in evaluating profits is the claim.

RUMNEY, J., and SHUMAN, S. Social Dividends from Public Housing. *Survey*. 81, 9:223 (Sept.), 1945.

**For Diagnosis Only**—Here you will find the low-down on the day-to-day details of running a cancer detection clinic. In this one, 176 men and 743 women have been examined in the course of five months. What happened in response to the examinations is recounted.

SCHRAM, M. W. S. The Organization and Results of Health Maintenance-Cancer Prevention Clinics. *J.A.M.A.* 129, 4:275 (Sept. 22), 1945.

**Dental Care for Americans**—There are 70 thousand American dentists and 24 million children who will demand the services of 25 thousand dentists to give essential care. The remaining 45 thousand dentists are left to do the job for the rest of us—a ratio of 1 to 2,000! Solutions for this poser are offered.

STRUSSER, H. Dental Problems in Postwar Planning. *J. Am. Dent. A.* 32, 15:991 (Aug. 1), 1945.

**"His Sisters and His Cousins and His Aunts"**—One technic for conducting the first post-partum visit is described. All persons interested in the infant including household employees and relatives, but particularly the father, are included in the instructions which are thorough.

TOMPKINS, C. A. Preventive Care of Infants and Children. *Am. J. Dis. Child.* 70, 1:32 (July), 1945.

**Can Germs Be Wafted Away?**—School ventilation standards of 30 cu. ft. per minute per child are hard to attain and do not prevent the spread of classroom infections. Radiant disinfection of the air does a better job.

WELLS, M. W. Ventilation in the Spread of Chicken Pox and Measles Within School Rooms. *J.A.M.A.* 129, 3:196 (Sept. 15), 1945.

**To Replace Assembly-line Oncè-overs**—Health guidance rather than wholesale medical inspections is a significant trend, this writer asserts. I hope he's right! And if he is, then this paper has a claim to your eyes and mind, whatever your health job may be. There are also a baker's dozen of related papers on school health that cannot be listed here.

WILSON, C. C. Health Counseling in Schools. *Pub. Health Nurs.* 37, 9:436 (Sept.), 1945.

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.*

- THE ART AND SCIENCE OF NURSING. By Ella L. Rothweiler, R.N.; and Jean Martin White, R.N. 3rd ed. Philadelphia: Davis, 1945. 793 pp. 145 illus. Price, \$5.00.
- THE ART OF HOME NURSING. Simple Techniques and Practical Procedures. By Betty Quinn Wagner, R.N. Philadelphia: Davis, 1945. 314 pp., illus. Price, \$2.00.
- THE ART OF MEDICINE IN RELATION TO THE PROGRESS OF THOUGHT. A Lecture in the History of Science Course in the University of Cambridge, February 10, 1945. By A. E. Clark-Kennedy, M.D. New York: Macmillan, 1945. 48 pp. Price, \$.75.
- THE CLASSIFICATION AND TREATMENT OF INJURIES TO THE TEETH OF CHILDREN. A Reference Manual for the Dental Student and the General Practitioner. By Roy Gilmore. Ellis, D.D.S. Chicago: Year Book Publishers, 1945. 248 pp. Price, \$2.75.
- DIETOTHERAPY. CLINICAL APPLICATION OF MODERN NUTRITION. Edited by Michael G. Wohl, M.D. Philadelphia: Saunders, 1945. 1029 pp. 93 illus. Price, \$10.00.
- FUNDAMENTALS OF PHARMACOLOGY. By Clinton H. Thienes, M.D. New York: Hoeber, 1945. 497 pp. Price, \$5.75.
- HAHNEMANN: THE ADVENTUROUS CAREER OF A MEDICAL REBEL. By Martin Gumpert. New York: L. B. Fischer, 1945. 251 pp. Price, \$3.00.
- HANDBOOK OF INDUSTRIAL PSYCHOLOGY. By Dr. May Smith. New York: Philosophical Library, 1944. 304 pp. Price, \$5.00.
- HEALTH INSTRUCTION YEARBOOK, 1945. Compiled by Oliver E. Byrd. Stanford: Stanford University Press, 1945. 344 pp. Price, \$3.00.
- HERE'S HOW IT'S DONE. A POPULAR EDUCATION GUIDE. By Florence B. Widutis. New York: The Postwar Information Exchange, 1945. 74 pp. Price, \$1.00.
- HIDDEN HUNGER. By Icie G. Macy, Ph.D., and Harold H. Williams, Ph.D. Lancaster: Jacques Cattell Press, 1945. 286 pp. Price, \$3.00.
- HOW A BABY GROWS. A STORY IN PICTURES. By Arnold Gesell, M.D. New York: Harper, 1945. 78 pp. Price, \$2.00.
- HYGIENE. By J. R. Currie, M.D., and A. G. Mearns, M.D. 2nd ed. Baltimore: Williams & Wilkins, 1945. 432 pp., illus. Price, \$6.00.
- LARGE SCALE RORSCHACH TECHNIQUES. A MANUAL FOR THE GROUP RORSCHACH AND MULTIPLE CHOICE TEST. By M. R. Harrower-Erickson, Ph.D., and M. E. Steiner, M.A. Springfield, Ill.: Thomas, 1945. 420 pp. 70 illus. Price, \$8.50.
- LIFE AND HEALTH. By Charles C. Wilson, M.D., John L. Bracken, M.A., and John C. Almack, Ph.D. Indianapolis: Bobbs-Merrill, 1945. 557 pp., illus. Price, \$2.12.
- THE LOCAL HOUSING AUTHORITY AND THE ARCHITECT. By Oliver C. Winston. Chicago: Public Administration Service, 1945. 16 pp. Price, \$.60.
- MEDICAL NURSING. By Edgar Hull, M.D., and Cecilia M. Perrodin, R.N. 3rd ed. Philadelphia: Davis, 1945. 641 pp. 152 illus. Price, \$3.50.
- MENTAL HYGIENE. THE PSYCHOLOGY OF PERSONAL ADJUSTMENT. By D. B. Klein. New York: Holt, 1944. 498 pp. Price, \$2.80.
- MICROBES OF MERIT. By Otto Rahn. Lancaster: Jacques Cattell Press, 1945. 277 pp. Price, \$4.00.
- NEW DIRECTIONS IN PSYCHOLOGY. Toward Individual Happiness and Social Progress. By Samuel Lowy, M.D. New York: Emerson Books, 1945. 194 pp. Price, \$3.00.
- THE NURSE AND THE LAW. By Gene Harrison, R.N. Philadelphia: Davis, 1945. 353 pp. Price, \$3.00.
- OBSTETRIC MANAGEMENT AND NURSING. By Henry L. Woodward, M.D., and Bernice Gardner, R.N. 3rd ed. Philadelphia: Davis, 1945. 828 pp. 373 illus. Price, \$3.50.
- OUR AMERICAN BABIES. THE ART OF BABY CARE. By Dorothy V. Whipple, M.D. New York: M. Barrows & Co., 1944. 367 pp. Price, \$2.50.
- PEDIATRIC NURSING. By Abraham Levinson, M.D. 3rd ed. Philadelphia: Lea & Febiger, 1945. 299 pp. Illus. Price, \$3.00.
- PRINCIPLES OF PEDIATRICS AND PEDIATRIC NURSING. By Cecilia M. Knox, R.N. Philadelphia: Davis, 1945. 527 pp. Illus. Price, \$3.50.

**PSYCHOLOGY. PRINCIPLES AND APPLICATIONS.**

By T. L. Engle, Ph.D. Yonkers: World Book Co., 1945. 549 pp. Price, \$2.12.

**PULMONARY TUBERCULOSIS. A HANDBOOK**

FOR STUDENTS AND PRACTITIONERS. By R. Y. Keers, M.D., and B. G. Rigden. Baltimore: Williams & Wilkins, 1945. 273 pp., illus. Price, \$5.00.

**A SOCIAL SURVEY OF HEALTH AND ILLNESS IN**

URBAN FAMILIES. By Paul B. Gillen under the auspices of the Kips Bay-Yorkville District Health Committee and the Department of Public Health and Preventive Medicine of the Cornell University Medical College. New York: Cornell University Medical College, 1945. 55 pp. Price, \$1.00.

**TAKE IT EASY. THE ART OF CONQUERING**

YOUR NERVES. By Arthur Guy Mathews. New York: Sheridan House, 1945. 238 pp. Price, \$2.98.

**TEXTBOOK OF OBSTETRICS. Designed for the**

Use of Students and Practitioners. By Henricus J. Stander, M.D. 3rd ed. New York: Appleton-Century, 1945. 1287 pp. 973 illus. Price, \$10.00.

**TUBERCULOSIS IN THE UNITED STATES.**

**GRAPHIC PRESENTATION.** Vol. 3. Mortality Statistics for Cities of 100,000 or More Population by Age, Sex and Race, 1939-1941. Prepared by the Staff of the Field Studies Section of the Tuberculosis Control Division, U. S. Public Health Service under the direction of Carroll E. Palmer, M.D. New York: National Tuberculosis Assn., 1945. 194 pp. Free from Dr. Carroll E. Palmer, National Institute of Health, Bethesda 14, Md.

**UNDERSTANDING OURSELVES. A DISCUSSION****OF SOCIAL HYGIENE FOR OLDER BOYS AND**

GIRLS. By Marion L. Fagre. Minneapolis: University of Minnesota Press, 1944. 44 pp., illus. Price, \$.50.

**WHAT PEOPLE ARE. A STUDY OF NORMAL**

YOUNG MEN. By Clark W. Heath. Cambridge: Harvard University Press, 1945. 141 pp. Price, \$2.00.

**WOMEN PHYSICIANS. THE OUTLOOK FOR**

WOMEN IN OCCUPATIONS IN THE MEDICAL SERVICES. Women's Bureau, U. S. Department of Labor. Washington, D. C.: U. S. Gov. Ptg. Off., 1945. Bulletin 203, No. 7. 28 pp. Price, \$.10.

**X-RAY TECHNICIANS. THE OUTLOOK FOR**

WOMEN IN OCCUPATIONS IN THE MEDICAL SERVICES. Women's Bureau, U. S. Department of Labor. Washington, D. C.: U. S. Gov. Ptg. Off., 1945. Bulletin 203, No. 8. 14 pp. Price, \$.10.

**NEGRO WOMEN WAR WORKERS. Women's**

Bureau, U. S. Department of Labor. Washington, D. C.: U. S. Gov. Ptg. Off., 1945. Bulletin 205. 23 pp. Price, \$.10.

**WORKING WITH NEWSPAPERS. By Gertrude**

W. Simpson. New York: National Publicity Council, 1945. 32 pp. Price, \$.75.

**A COMPARATIVE STUDY OF SAMPLING DEVICES**

FOR AIR-BORNE MICRO-ORGANISMS. By H. G. duBuy, Alexander Hollaender and Mary D. Lackey. Supplement No. 184 to the Public Health Reports. Washington, D. C.: U. S. Gov. Ptg. Off., 1945. 40 pp. Price, \$.05.

**SOME ECONOMIC ASPECTS OF ALCOHOLIC**

PROBLEMS. Memoirs of the Section on Alcohol Studies, Yale University, No. 4. By Benson Y. Landis, Ph.D. New Haven: Quarterly Journal of Studies on Alcohol, 1945. 44 pp. Price, \$.50.

# ASSOCIATION NEWS

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

- Agnes W. Black, M.B., D.P.H., 4712 W. 6 Ave., Vancouver, B. C., Can., Medical Health Officer, Metropolitan Health Committee
- Moses J. Entin, M.D., 6210 Spencer Ave., New York 63, N. Y., Asst. Surgeon (R), U. S. Public Health Service
- Joe M. Funderburk, M.D., Arcadia, La., Director, Bienville Parish Health Unit
- Francis E. Hillman, M.D., 6508 Moore Drive, Los Angeles 36, Calif., Public Health Physician, Los Angeles County Health Dept.
- Roger A. Kennedy, D.P.H., City Hall, St. Thomas, Ontario, Can., Senior Medical Officer of Health, Elgin-St. Thomas Health Unit
- Nicolai N. Rilcoff, M.D., 1830 Flower St., Bakersfield, Calif., Kern County Director of Public Health

### *Laboratory Section*

- Federico Chavez R., M.D., 805 E. Huron St., Ann Arbor, Mich., Jefe de la Secc. Antirrabica del Instituto Bacteriologico de Chile
- Frederick W. LaCava, Ph.D., Box 97, Hopemont, W. Va., Director of Laboratories, Hopemont Sanitarium
- Z. Lois Peterson, 521 Oak St., Grand Forks, N. D., Bacteriologist, Div. of Labs., State Health Dept.
- Arlan G. Roberts, 143 E. Court, Dayton 3, O., NCO in Charge of Sanitation, Patterson Field, AUS
- Ralph H. Tash, 1396 Peachtree St., N.E., Atlanta, Ga., Bacteriologist, Veterinary Div., State Dept. of Agriculture
- Stanley J. Thomas, Ph.D., Lehigh Univ. Dept. of Biology, Bethlehem, Pa., Head, Dept. of Biology

### *Vital Statistics Section*

- Constance W. Altshuler, M.S.P.H., 103 Waverly Pl., New York 11, N. Y., Medical Statistician, National Foundation for Infantile Paralysis
- Nancy J. Brombacher, National Institute of Health, Bethesda 14, Md., Junior Statistician, U. S. Public Health Service

- Thomas P. Lesesne, 3307 Murray St., Columbia 55, S. C., Chief Clerk, Div. of Vital Statistics, State Board of Health
- Mary I. Lorenz, State Dept. of Health, Oklahoma City, Okla., Junior Statistician
- Sophie Rakesky, M.S., W. K. Kellogg Foundation, Battle Creek, Mich., Statistician

### *Engineering Section*

- Henry R. Karmasin, 3529 N. Keating Ave., Chicago, Ill., Sanitarian, Evanston Health Dept.
- Henry B. Nabers, C.E., 602 Broad St., Wichita Falls, Tex., Public Health Engineer, Wichita City-County Health Unit

### *Industrial Hygiene Section*

- Edison de Freitas Teixeira, M.D., M.P.H., Dept. de Saude, Seccao de Higienedo Trabalho, Sao Paulo, Brazil, S. A., Asst. Health Officer, State of Sao Paulo
- Haven L. Williams, 327 Central Trust Bldg., Altoona, Pa., District Industrial Hygiene Engineer, State Dept. of Health

### *Food and Nutrition Section*

- J. Newlin Embree, 350 Madison Ave., New York 17, N. Y., Mgr., Vitamin Div., Borden Co.
- Elizabeth W. Jukes, M.S., 709 W. Kalamazoo, Lansing 15, Mich., Nutrition Consultant, State Dept. of Health

### *Public Health Education Section*

- Karl Bleyl, Ph.D., 412 W. Willow, Normal, Ill., Asst. Prof. of Bio-Science, Illinois State Normal Univ.
- Margaret E. Jones, D.D.S., M.P.H., 1824 Geddes Ave., Ann Arbor, Mich., Health Educator, Mott Foundation, Flint, Mich.
- Consuelo Rodriguez, Box 372, Manati, P. R., Medical Social Worker, Health Dept.
- Dorothy C. Tipple, R.N., North St., West Winfield, N. Y., Nurse Teacher, West Winfield Central School
- Hannah M. Turnage, M.S., State Board of Health, Raleigh, N. C., Health Educator, School Health Coordinating Service, State Board of Health and Dept. of Public Instruction

Glen W. Tuttle, M.D., D.T.M., A.B.F.M.S.,  
Sona Bata, via Matadi, Belgian Congo,  
Africa, Principal, School of Nursing, Ecole  
Protestantes des Auxiliaires Medicaux au  
Congo

Harriett M. Williams, 326 Locust St., Akron,  
O., Social Worker, Summit County Tubercu-  
losis Assn.

#### *Public Health Nursing Section*

Gertrude J. Davis, 1317 W. 20 St., Little  
Rock, Ark., Case-finding and Health Edu-  
cation, County Tuberculosis Assn.

Harriet H. Foster, R.N., 1241 De Siard,  
Monroe, La., Staff Nurse, State Dept. of  
Public Health

Elizabeth Reed, R.N., 980 Main St., Jackson-  
ville 2, Fla., Director, Jacksonville Visiting  
Nurse Assn.

Ruth E. Rives, M.A., 3 Mason St., Glens  
Falls, N. Y., District State Supervising  
Nurse, State Dept. of Health

Norma F. Whiteside, 816 Oregon Bldg., Port-  
land 4, Ore., Senior Asst. Nurse Officer (R),  
U. S. Public Health Service

#### *Epidemiology Section*

John M. Chapman, M.D., M.P.H., 425  
Lamarck Drive, Buffalo 21, N. Y., Asst.  
District Health Officer, State Dept. of  
Health

Laurence J. Charles, D.T.M., M.P.H., Ma-  
laria Control Unit, St. Lucia, B.W.I.,  
Malariologist, Leeward-Windward Isles

Merl G. Colvin, M.D., R.D. 2, Williamsport,  
Pa., Health Officer

James P. Conway, M.D., 4309 N. Prospect  
Ave., Milwaukee 11, Wisc., Epidemiologist,  
U. S. Navy

William Wen-ming Li, M.D., 1 Hsiao-si-Lu,  
Lanchow, Kansu, China, Director, Dept. of  
Epidemiology, National Northwest Institute  
of Health

#### *School Health Section*

Ross L. Allen, Dr.P.H., 40 N. Church St.,  
Cortland, N. Y., Prof. of Health Education,  
New York State Teachers College

Marion Fenner, R.N., 23 E. Pueblo, Santa  
Barbara, Calif., School Nurse, Santa Bar-  
bara City Schools, Health Dept.

Hermína A. Hartig, M.D., 2901 Vincent Ave.,  
N., Minneapolis 11, Minn., Chief School  
Physician, Minneapolis Public Schools,  
Board of Education

Raymond F. Lenart, M.A., 210 S. St. Clair  
St., Painesville, O., Student, Univ. of  
Michigan

#### *Dental Health Section*

Benjamin F. Gunter, D.D.S., 400 W. Hill  
Ave., Knoxville, Tenn., Dental Officer, State  
Dept. of Public Health

#### *Unaffiliated*

Hallie I. Morgan, M.D., M.P.H., 217, Ob-  
servatory St., Ann Arbor, Mich., Research  
Asst. in Economics, School of Public Health,  
Univ. of Michigan

Paul A. Scott, M.D., C.M., 5½ McKenzie  
Crescent, Toronto, Ontario, Can., Student,  
School of Hygiene, Univ. of Toronto

#### DECEASED MEMBERS

Craig Barrow, M.D., Savannah, Ga., Elected  
Member 1926, Public Health Education  
Section

Robert E. Perdue, M.D., Norwalk, Conn.,  
Elected Member 1940, Health Officers  
Section

Jose M. Santiago, M.D., Vega Baja, Puerto  
Rico, Elected Member 1944, Health Officers  
Section

Francisco Sein, M.D., Laras, Puerto Rico,  
Elected Member 1944, Health Officers  
Section

Smith L. Turner, M.D., Williston, Fla., Elected  
Member 1945, Health Officers Section

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

### POSITIONS AVAILABLE

(Supplemental to lists in recent Journals)

**Wanted:** Two full-time physicians, immediate appointment. Conduct small venereal disease clinics on rotating schedule. Beginning salary \$3,600 plus travel. Salary range \$3,600 to \$4,800 with \$300 semiannual increases depending upon performance and availability of funds. Appointments limited graduates United States and Canadian Class A Medical Schools eligible licensure New Mexico. Physicians under 50 years with v.d. experience preferred. Address Director, State Health Dept., Box 711, Santa Fe, N. M.

**Wanted:** Medical officers for positions. Director of preventable diseases, director of maternal and child health, district health officers; excellent opportunities for right men. Salary to start \$4,500 year and travel expense. Positions permanent. Write G. F. Campana, M.D., State Health Officer, Bismarck, N. D.

**Wanted:** Health education secretary by tuberculosis association in large western city. Emphasis on community and school program plus publicity. Attractive position open in agency with dynamic program closely related to official groups. Write Box DS, Employment Service, A.P.H.A.

**Industrial Hygiene Engineer** position available with Oregon State Board of Health. \$275-\$325 per month. Requires B.A. in chemical engineering, 2 years as industrial hygiene engineer in government agency and 1 year graduate work in chemical engineering or industrial hygiene (or additional 2 years' experience). Write Merit System Council, 616 Mead Bldg., Portland 4, Ore.

**Wanted:** Technical Service & Development positions open with company established in specialized industrial chemical fields. Permanent positions with attractive future for young men, age 22-32, with Bachelor's degree in chemistry or chemical engineering. Previous ex-

perience in food processing desirable but not essential. Write complete details to Box CE, Employment Service, A.P.H.A.

**Health Education Worker**, vicinity New York City, to conduct a joint health education program for an official and nonofficial agency. Salary approximately \$2,500, 5½ day week, 5 days in summer, with one month vacation. Degree in health education preferred but will consider applicants with experience in public health. Write Box SI, Employment Service, A.P.H.A.

**Wanted Immediately:** Two industrial hygiene medical consultants (physicians) for permanent positions with State Dept. of Health. Salary from \$440 to \$525 per month plus \$20 cost of living bonus, with travel allowance up to \$6 per diem while in field. Training and experience in industrial hygiene desirable. Apply Arthur L. Ringle, M.D., Director, State Dept. of Health, Seattle, Wash.

**Wanted:** Full-time health officer. If interested address George A. Tierney, 164 Court St., Middletown, Conn., stating age, qualifications and minimum salary expected.

**Executive Secretary Wanted:** For Columbia Co. Tuberculosis Eradication Association. Applicant must have specialized training in health education. Car furnished. Apply with full information to Rev. S. F. Olszewski, 426 Warren St., Hudson, N. C.

**Wanted:** Public Health Nurses in Hawaii Bureau of Public Health Nursing, Board of Health, Territory of Hawaii, has urgent need of staff nurses. Salary starts at \$192.50 plus \$45 bonus for nurses with a one-year accredited course in public health nursing and one year of successful experience. Maximum for this position \$237.50. Write to Board of Health, Honolulu, T. H. Use clipper mail (15¢).



## POSITIONS WANTED

Toxicologist, formerly with CWS, desires position in northeastern states, preferably New York. Was director of laboratory consisting of bacteriologists, biologists, chemists, and aides. Experience further includes sanitation field, waste disposal, boiler and water treatment. Would also consider research and teaching arrangement at a university to finish one year graduate study needed toward Ph.D. degree. Age 32. E-484

Well established woman physician with M.P.H. from Harvard and 5 years' experience as county health officer, will consider a position in the field of communicable disease control at a salary of \$5,000 or better. A-516

Medical Entomologist, age 32, Ph.D. in entomology Cornell University, wishes teaching position with a medical school

or university. Would also be interested in malaria and/or mosquito control work. Over 3 years in Sanitary Corps, U. S. Army. Co-author of textbook on identification and habits of mosquitoes now in press. Sigma Xi. Excellent references. E-485

Bacteriologist-Immunologist; A.B. degree plus graduate work; public health and teaching experience. Excellent references. L-475

Laboratory technician, B.S. in biology, wishes position preferably in metropolitan area though not essential. Experienced in chemistry and bacteriology, 2 years with Public Health Service and City Health Department. Knows analysis and media room direction. Just completed course in x-ray with Public Health Service. L-477

# Opportunities Available

## Advertisement

WANTED—(a) Health commissioner; well trained in public health administration; progressive program; Southeast. (b) Venereal disease control officer; county health department; headquarters in town of 80,000 located approximately midway between Los Angeles and San Francisco. (c) Medical director of crippled children's program; pediatrician with public health experience or training preferred; department responsible for providing medical and surgical care of approximately 5,000 children; well staffed department, rapidly growing; permanent headquarters in university medical center; Middle West. (d) Student health physician; co-educational college; duties consist principally of office consultation, examinations, treatment of students; occasional hygiene lectures; advantageous if particularly well qualified or interested in internal medicine; noted health resort located in Rocky Mountain area. (e) Public health director for county of 80,000; minimum \$6,500; Middle West. (f) Young woman physician for student health appointment; competent medical clinician interested in student health work as career required; duties include responsibilities for preventive and acute medicine as well as for hygiene and public health lecturing. **PH11-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Health educator; municipal tuberculosis association having active tuberculosis program under way; must be qualified to present to general public some of major tuberculosis programs as well

as basic information on community aspects of tuberculosis work; duties would include some work with the public schools; interesting opportunity; West. (b) Health coordinator; must be well trained in medical sciences, public health and education; duties include visiting communities throughout state and directing experimental centers in school health, guiding school and health personnel in developing school health programs, participating on faculty of university; Middle West. (c) Public health nurse; generalized program, county of approximately 30,000; Pacific Northwest. (d) Public health supervisor; cancer service, county health program; preferably some one skilled not only in care of patients but qualified also to present educational side of cancer program; organization works closely with health organizations in three major cities and with several hospitals conducting cancer clinics; East. (e) Public health nurse; state tuberculosis association; duties include traveling with mobile unit; \$185-190, traveling expenses; Middle West. (f) Several nurses for industrial dispensary; large industrial company; \$200; South. **PH11-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

WANTED—(a) Bacteriologist; preferably some one with about three years' experience in public health bacteriology; state owned hospital specializing in tuberculosis work; \$230 with rapid increases; Middle West. **PH11-3**

# Opportunities Wanted

## Advertisement

HEALTH EDUCATOR; B.S., M.S., and Ph.D. degrees; several years, instructor in biology, bacteriology and health; state university; three years, public health educator, city and county health department; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

YOUNG PHYSICIAN expecting early discharge from Navy; A.B., M.D. degrees eastern schools; upon entering Navy directly from internship, completed course in epidemiology; nearly three years' field experience in epidemiology, preventive medicine, tropical medicine and sanitation, including eighteen months in Central Pacific area of Operations; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11

BACTERIOLOGIST; A.B., M.A., Ph.D. degrees; several years' successful teaching and research ex-

perience in general, dairy and food bacteriology; past several years, director, bacteriological department, metropolitan department of public health; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

DENTIST who has specialized in public health; D.D.S., university medical school; several years' private practice; year of postgraduate training in public health hygiene with special emphasis on public health dentistry for which he received degree of M.S.P.H.; several years, state department of health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

HEALTH EDUCATOR; M.S. in public health; three years, director health education; county health department; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

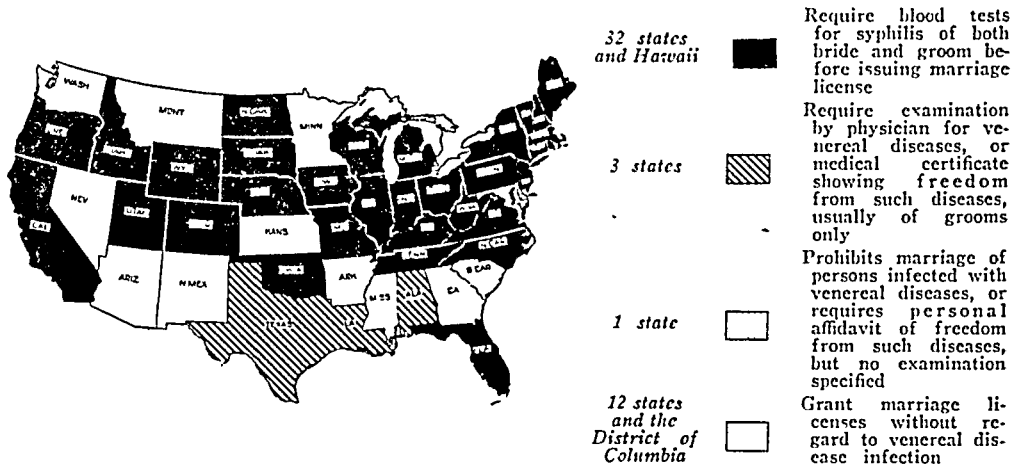
# NEWS FROM THE FIELD

## NEW SOCIAL HYGIENE LAWS IN 1945

At least 26 of the 44 state legislatures having regular sessions in 1945 considered social hygiene legislation. The results in summary are shown in the maps and notes below.

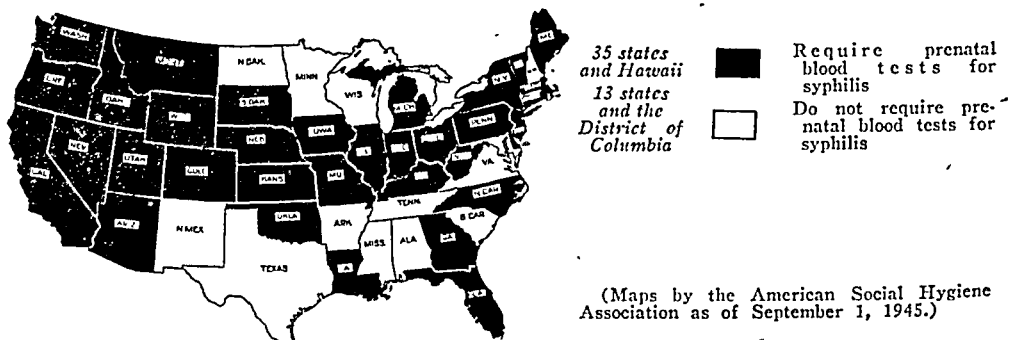
### Premarital Examination Laws

Out of 17 states considering such bills, two states—Florida and Oklahoma—and also the Territory of Hawaii, adopted premarital examination laws; and laws were amended in Maine, Michigan, North Carolina, Pennsylvania, West Virginia, and Utah. Thirty-two states and the Territory of Hawaii now protect marriage from syphilis by requiring examinations of both bride and groom, including a blood test for syphilis.



### Prenatal Examination Laws

Ten states considered bills and five—Arizona, Florida, Montana, Ohio and West Virginia—adopted new laws. Amendments to the existing laws were passed in Maine and Oklahoma. Babies are now protected from syphilis by blood tests of expectant mothers in 35 states, and the Territory of Hawaii.



## EYE-BANK COUNCIL

The Eye-Bank for Sight Restoration, Inc., 210 East 64th Street, New York 21, N. Y., has announced the appointment of a National Eye-Bank Council made up of 75 leaders in the fields of medicine, finance and business, who will serve as members of a council for the Eye-Bank. The Council's Chairman is Albert G. Milbank of New York City. The Council will aid in the plan to establish a nation-wide eye-bank for obtaining and making available healthy corneal tissue to restore the vision of persons whose sight has been lost through affections of the cornea. The plan which the Council is sponsoring includes research, study, and instruction of ophthalmologists in the surgical technics required in performing the corneal graft operation. Fellowships which will enable advanced study in causes of corneal infections, and in methods to increase the time which corneal tissue may be preserved and made available for use in sight restoration operations, are also included in the plan.

Similar to the function of blood banks in restoring exhausted blood supply, the Eye-Bank was organized to make possible restoration of the sight of persons whose vision has been destroyed because of corneal affections by replacement with healthy tissue from the eyes of other persons. Of the 250,000 persons in the United States who are presently blind, it is estimated, according to the Council, that the sight of 5 to 7 per cent has been lost through opaque corneas, and that the vision of approximately 10,000 of those so affected might be restored if healthy corneal tissue were available for the corneal graft operation. It is the purpose of the Eye-Bank to locate, obtain, and have accessible wherever and whenever needed the corneal tissue. This capital stock of the Eye-Bank may be obtained only from persons whose sight requires the removal of an eye whose

corneal tissue is unimpaired, or by obtaining the healthy eyes of persons immediately after death.

Inasmuch as the effectiveness and serviceability of the Eye-Bank depend upon the immediate availability of corneal tissue which must be taken from human eyes, it is necessary and important to educate both professional and lay groups in coöperating to make possible this latent procedure.

Under guidance of the Council, a movement has been launched to procure eyes removed from those whose corneal tissue is not affected, and also the eyes of persons of unimpaired vision immediately after death. At present, it is possible to preserve corneal tissue for utilization in the delicate graft operation for only 72 hours; therefore it is necessary to arrange for the speedy collection and preservation of eyes immediately upon removal. Such a plan is already in limited operation among representative eye hospitals and surgeons in New York and several other cities, and it is part of the Eye-Bank plan to expand this activity to include such institutions and the profession throughout the United States.

## DRS. DUBLIN AND BAUMGARTNER

## RETURN FROM FRENCH MISSION

Dr. Louis I. Dublin, Second Vice President and Statistician of the Metropolitan Life Insurance Company and Assistant to the Chairman of the American Red Cross, left late in August for a Red Cross mission to France. He was accompanied by Leona Baumgartner, M.D., Ph.D., Director of the Bureau of Child Hygiene in the New York City Department of Health and Associate Editor of the *American Journal of Public Health*.

According to the announcement, the privations of war and the evils of Nazi military occupation have left their stamp on the health of the French people. Particularly serious has been

the damage done to the health of the children. among whom malnutrition, tuberculosis, diphtheria, and other diseases have taken a heavy toll. In fact, the problem of child health is so urgent and of such magnitude that the French Government has called upon the American Red Cross for assistance. This organization was requested to send representatives to study the situation at first hand and to make recommendations as to the part that the American Red Cross may play in a coördinated plan of relief for the children, in which the French Government as well as other interested agencies would participate.

MAJOR GENERAL GEORGE C. DUNHAM  
RETIRES

Major General George C. Dunham, M.C., U. S. Army, who has been serving as President of the Institute of Inter-American Affairs, Washington, has resigned as of August 30 for health reasons. Dr. Dunham will be retired from active duty in the Army as of October 31. His address will continue to be in care of the Institute of Inter-American Affairs, Washington.

General Dunham is a graduate in medicine of the University of Oregon in 1914, and received a doctorate in public health from Johns Hopkins School of Hygiene and Public Health in 1921. He is the author of the volume *Military Preventive Medicine*, which has appeared in three editions. General Dunham is known internationally for his service, especially in recent years, supervising the work done in health and sanitation in Central and South America under the auspices of the Coördinator of Inter-American Affairs and of the Institute.

COLONEL GOTAAS ELECTED PRESIDENT  
INSTITUTE OF INTER-AMERICAN  
AFFAIRS

Colonel Harold B. Gotaas, Sn.C., U. S. Army, has been elected President

of the Institute of Inter-American Affairs, Washington, succeeding Major General George C. Dunham, U.S.A., who has retired on account of health and has assumed the chairmanship of the Board of Directors of the Institute. Colonel Gotaas is a native of South Dakota and has received degrees in civil engineering at the University of South Dakota and Iowa State College. He holds the doctorate in sanitary and public health engineering from Harvard University. Prior to his service in the Army, Colonel Gotaas was Professor of Public Health Engineering at the University of North Carolina. He holds decorations from the governments of Chile and Bolivia for his help in sanitation work which he has carried on as director of the Institute's Health and Sanitation Division.

Colonel Gotaas's successor as director of the Health and Sanitation Division is Colonel John Yeagley.

DR. WARREN F. DRAPER DECORATED,  
RETURNS TO UNITED STATES

Major General Warren F. Draper, M.C., U. S. Army, has returned to the United States and as of October 1 resumed his position as Deputy Surgeon General, U. S. Public Health Service, Bethesda, Md. General Draper served as a member of General Eisenhower's staff from May 1, 1944, to June 1, 1945, as Chief of the Public Health Branch and chief public health adviser at Supreme Headquarters, Allied Expeditionary Forces.

Dr. Draper was recently made an Honorary Companion of the Bath by order of His Majesty, King George of England, the presentation having been made at a ceremony in London by Field Marshall Sir Arthur Tedder.

The Distinguished Service Medal has been awarded to Dr. Draper, who "served with conspicuous distinction as Chief of the Public Health Branch. . . . He directed the formulation and

execution of the Supreme Commander's policies governing public health in liberated nations and conquered territories. Drawing on his many years' experience, he coordinated all resources for the prevention and control of civilian epidemics which might have interfered with military operations, and successfully met tremendous problems caused by the chaotic conditions left by the war in many areas. The plans and procedures drawn up by General Draper were successful in every test. Through controlling disease in Europe, he contributed to the highest degree to the success of the Allied forces."

#### BRONZE STAR MEDAL TO LOUIS L. FELDMAN

Louis L. Feldman, First Lieutenant, Medical Administrative Corps, Medical Section, Allied Force Headquarters, was awarded the Bronze Star Medal "for meritorious achievement in connection with military operations . . . as Medical Statistician and Records Officer for the Surgeon, Mediterranean Theater of Operations . . . Lieutenant Feldman's executive ability, thorough command of statistical methods, and painstaking accuracy rendered his performance of duty an outstanding contribution to the successful accomplishment of the Army Medical Department's mission." Lieutenant Feldman was formerly a member of the A.P.H.A. staff, is on leave from the New York State Department of Health, and is assigned to the Office of the Surgeon General, U. S. Army.

#### UNRRA APPOINTS CHIEF NURSE OF THE HEALTH DIVISION

The United Nations Relief and Rehabilitation Administration has announced the appointment of Lillian J. Johnston, R.N., as Chief Nurse in the Health Division. She recently has been serving as Acting Chief Nurse. Miss Johnston was graduated from the Hart-

ford Training School for Nurses and from Teachers College, Columbia University, New York. She began her work as a Senior Public Health Nurse with the Office of Foreign Relief and Rehabilitation Administration in December, 1943.

#### MACY FOUNDATION RECEIVES ADDITIONAL FUNDS FOR HEALTH STUDIES

The Josiah Macy, Jr., Foundation of New York City has been made residuary legatee for the estate of Mrs. Kate Macy Ladd of New Jersey, who died August 27. Mrs. Ladd was the founder of the Macy Foundation and has made other funds available, including two and one-half million dollars, of which the income will be used "to initiate, stimulate, develop, and support scientific investigations of the fundamental aspects of health, sickness, and the relief of suffering."

#### DR. BRYAN APPOINTED DEPUTY DIRECTOR OF HEALTH FOR UNRRA

Herbert H. Lehman, Director General of the United Nations Relief and Rehabilitation Administration, Washington, has announced that Dr. A. Hughes Bryan, an officer of the U. S. Public Health Service who has been serving with UNRRA since July, 1944, has been appointed Deputy Director of Health of UNRRA succeeding James A. Crabtree, M.D., Medical Director, U. S. Public Health Service.

Dr. Bryan is a graduate in medicine from Harvard and was formerly assistant professor in the Department of Medicine, University of Chicago. Dr. Crabtree has returned to his duties with the Public Health Service in which he has served since 1938. He is a graduate of the University of Tennessee School of Medicine and served for years with the State Department of Health in Tennessee and with the Tennessee Valley Authority. He has

been with UNRRA since its inception and has served both as Acting Director and Deputy Director of Health.

#### COLONEL HENNESSY RECEIVES BRONZE STAR MEDAL

Lieutenant Colonel Harold R. Hennessy, MC, AUS, now in Germany and formerly with the California State Health Department in county health work, has been awarded the Bronze Star Medal "for meritorious service in connection with military operations against the enemy . . . in Belgium and Germany. As Public Health Officer in the Office of the Army Surgeon, Lieutenant Colonel Hennessy demonstrated outstanding qualities of leadership by organizing and directing the public health control of displaced persons, refugees, and the German civil population in the Rhineprovinz military district. Through his personal efforts the spread of typhus fever throughout the Army area was halted in a remarkably short time, thus averting a critical problem. Colonel Hennessy's reliability, aggressiveness and tactful nature reflect great credit upon himself and the Armed Forces of the United States."

#### FEDERAL INTER-AGENCY COMMITTEE ON SCHOOL HEALTH

The U. S. Commissioner of Education, J. W. Studebaker, has announced that the Office of Education expects to aid in every way the development and improvement of the program of health and physical education in the schools. According to Dr. Studebaker, the Office has sponsored the formation of a Federal Inter-Agency Committee to plan coöperatively the activity of the federal government in school health, including the existing programs and the planning for extension of these programs. The committee will consist of one representative from the U. S. Office of Education, one from the Public Health Service, and one from the

Children's Bureau. This committee will serve as a coördinating group to help plan health programs to meet the needs of the school-age child and to eliminate duplication of effort. Dr. Studebaker states that funds have not been appropriated for the current fiscal year for the continuation of the National Committee on Physical Fitness.

#### AMERICAN COMMITTEE ON MATERNAL WELFARE SEEKS RELEASE OF OBSTETRICIANS AND GYNECOLOGISTS

Fred L. Adair, M.D., Chairman of the American Committee on Maternal Welfare, Inc., Chicago, has written President Harry S. Truman and the officials of the War and Navy Departments and of Congress urging the prompt release to civilian practice of qualified specialists in obstetrics and gynecology who are now serving with the armed forces. According to Dr. Adair, there is an acute need both for those qualified as specialists who are already established in practice and those on their way to specialized status whose careers have been cut short by the call to service. He points out that the practice of obstetrics and gynecology is essentially a civilian service and that the care of mothers and women has been seriously curtailed. It is maintained that failure to release these officers to civilian life promptly will seriously hamper existing services and educational facilities, as well as the progress of plans designed for the future welfare of mothers, new-born infants, and women.

#### AMERICA TYPHUS COMMISSION MEDAL AWARDED DR. MAXCY AND DR. BLAKE

The United States of America Typhus Commission Medal was awarded at the Office of The Surgeon General on September 10 to Dr. Kenneth F. Maxcy, Professor of Epidemiology at Johns

Hopkins School of Hygiene and Public Health, and Dr. Francis G. Blake, Dean of Yale University School of Medicine, for "exceptionally meritorious service." Both Dr. Maxcy and Dr. Blake, in addition to their other duties, are consultants to the Secretary of War.

The awards were presented by Major General George F. Lull, Deputy Surgeon General of the Army. Dr. Maxcy was commended for "his observations made in the field under difficult campaign conditions, which clarified earlier knowledge of the conditions under which scrub typhus occurs and added greatly to information about the special conditions which were making this disease a health hazard of paramount importance to American troops."

The citation accompanying the award to Dr. Blake said in part: "Dr. Blake initiated and directed investigations of classical importance on the clinical features and prevention of scrub typhus. He made new contributions to the knowledge and control of a form of typhus fever of great military and civilian importance. His wisdom, energy, and special competence assured the success of this mission and laid the basis for enduring benefits."

The Typhus Commission medal, which was authorized by President Roosevelt, is regarded as a high honor in this field of science. Only about thirty men have been awarded it to date.

#### GRADUATE COURSE IN INDUSTRIAL MEDICINE AT LONG ISLAND

The Long Island College of Medicine, Brooklyn, N. Y., has announced the presentation of the fourth graduate course in industrial medicine, January 14 to February 1, 1946. Afternoon and evening seminars and morning clinics devoted to intensive orientation in industrial medical administration, internal medicine in industry, the occupational diseases, and industrial

surgery will make up the course. Inquiries should be addressed to the Department of Preventive Medicine and Community Health, 248 Baltic St., Brooklyn 2, N. Y.

#### NORTH DAKOTA STATE DEPARTMENT OF HEALTH NEW STAFF APPOINTMENTS

Three staff appointments to the North Dakota State Department of Health have been made by Dr. G. F. Campana, State Health Officer. Bernardine Cervinski will be director of Health Education; Fred J. Baker has been assigned as chemist in the Public Health Laboratory at Bismarck; and Richard M. Ludemann will be lay venereal disease investigator for the division of Preventable Diseases. Dr. Campana also announces that Irene M. Donovan, Director of Public Health Nursing, has resumed her duties after an educational leave spent at the University of Minnesota.

#### STUDENT HEALTH ACTIVITIES

New student health service buildings are being planned for the University of Alabama, University; University of Colorado, Boulder; Connecticut College, New London; University of Delaware, Newark; and the University of British Columbia.

#### DR. STEBBINS APPOINTED TO JOHNS HOPKINS FACULTY

The appointment of Ernest Lyman Stebbins, M.D., M.P.H., Commissioner of Health of New York City, as Professor of Public Health Administration in the School of Hygiene and Public Health, Johns Hopkins University, was announced on October 21 in Baltimore. Dr. Stebbins will succeed Allen W. Freeman, M.D., presently Professor of Public Health Administration in the School, who will retire in June 1946. Dr. Stebbins will also become Assistant Director of the school and will succeed Lowell J. Reed, Ph.D., the present



Director, at the expiration of his term.

Dr. Stebbins, who has served for more than three years in his present post, is on leave as Professor of Epidemiology at the School of Public Health, Columbia University, New York City. He is expected to assume his new appointments by July 1, 1946.

#### TEXAS CRIPPLED CHILDREN SERVICES

The transfer of the responsibility for administration of the Texas Program of Services to Crippled Children from the State Department of Education to the State Department of Health was recently authorized.

### PERSONALS

#### Central States

RUTH EVELYN BOYNTON, M.D.,† Minneapolis, was recently elected President of the Minnesota Department of Health.

DAVID E. ELLISON, M.D., has resigned as Venereal Disease Control Officer of the Minneapolis Department of Health, effective September 1.

HENRIETTA M. HERBOLSHEIMER, M.D.,† Acting Chief of the Division of Maternal and Child Hygiene, State Department of Health, Springfield, Ill., has been named Secretary of an Executive Committee to conduct a survey of Illinois hospital facilities. Newspapers report that the group will operate under authority of an advisory council appointed by Governor Green to determine hospital needs throughout the state.

LAWRENCE J. LINCK,† Chicago, Ill., has resigned as Director of the Syphilis Control Project of the Chicago Board of Health to become Executive Director of the National Society for Crippled Children and Adults, Inc., which has moved its offices to Chicago.

SAMUEL N. MALLISON, M.D.,† has resigned as Superintendent of Health of Decatur, Ill., effective August 1,

to join the State Department of Health as District No. 6 Health Officer with headquarters in Campaign. He will be in charge of the district including Livingston, Kankakee, Ford, Iroquois, and Vermilion Counties.

HERMAN G. MORGAN, M.D., was recently appointed Secretary of the newly created Indianapolis Board of Health and Hospitals and Director of Public Health. The Board was established by the last legislature and supplants two separate boards. Other appointees include DRs, CHARLES W. MYERS, Director of Hospitals; KENNETH G. KOHLSTAEDT, Medical Director of the Indianapolis City Hospital; JAMES D. PEIRCE, JR., Assistant Director of the hospital, and GERALD F. KEMPF, Superintendent of Preventive Medicine.

#### Eastern States

G. DONALD BUCKNER,† Worcester, Mass., has resigned as Executive Secretary of the Southern Worcester County Health Association to become Secretary of the Tuberculosis Committee of the New York Tuberculosis and Health Association, New York, N. Y., effective October 1.

VIVIAN DRENCKHAHN † has joined the staff of the National Tuberculosis Association, New York, N. Y., as Associate in Health Education on October 1. During the past three years, Miss Drenckhahn has been in government service, first detailed to the U. S. Office of Education as Senior Specialist in Nutrition, and later serving as field consultant in southwestern states for the Nutrition Programs Branch, War Food Administration.

HAZEL A. HART,† New York, N. Y., has resigned as Director of Recruiting, Training and Placement of the State Committee on Tuberculosis and Public Health, State Charities Aid

Association, to become Director of Seal Sale for Canada for the Canadian Tuberculosis Association with headquarters in Ottawa.

WILLIAM C. INMAN, M.D., of Danvers, Mass., has been appointed Director of the Division of Mental Hygiene and Research of the Massachusetts State Department of Mental Health.

HERBERT R. KOBES, M.D.,† Director of Medical Services, Maine Department of Health and Welfare, Augusta, Me., has been appointed Director of the Division of Services for Crippled Children of the University of Illinois, with central offices in Springfield, Ill. He succeeds LAWRENCE J. LINCK,† who recently resigned to become Executive Director of the National Society for Crippled Children.

EDWIN J. MACÉWAN's appointment as Administrative Director of the American Cancer Society was announced by ELMER H. BOBST, Chairman of the Executive Committee of the Board. The office is newly created and carries full responsibility for the business management of the cancer organization which is national in scope with affiliates in virtually every state in the nation. It becomes effective October 15.

JOHN OBERWAGER, M.D.,\* who for many years has served as Director of the Sanitary Bureau, New York City Department of Health, has been transferred to become the Director of the Division of Health Education in the Department, succeeding SAVEL ZIMAND,\* resigned.

ELMER H. STOTZ, M.D., has been named head of the new Division of Food Science and Technology that has been established at the New York State Experiment Station at Geneva by merging the Divisions of Bacteriology and Chemistry. The work of the group is to be guided by a committee consisting of members of the former divisions. This commit-

tee will consist of DR. STOTZ, who was head of the Division of Chemistry, Chairman; DR. GEORGE J. HUCKER\* and DR. CARL S. PEDERSON,\* Professors of Bacteriology; and DR. ZOLTAN I. KERTESZ, Professor of Chemistry.

LIEUT. COL. HARRY W. WEEST, JR., formerly Chief Surgeon of the 28th Division, has been appointed Secretary of Health of Pennsylvania to succeed DR. ALEXANDER H. STEWART,† Harrisburg, who died July 31. DOROTHY WORTHINGTON, M.D.,\* White Plains, N. Y., has resigned as Director of the Division of Maternal and Child Health, Westchester County Department of Health, to take up the private practice of pediatrics in White Plains.

SAVEL ZIMAND,\* New York, N. Y., has resigned as the Director of the Bureau of Health Education in the New York City Department of Health to accept appointment as Executive Director of the New York City Cancer Committee, effective October 1.

#### Southern States

EDMOND J. BRYSON, M.D., Liberty, S. C., who has been serving as Health Officer for Oconee and Pickens Counties, has been assigned Health Officer for Pickens County only, and DR. FURMAN T. SIMPSON, Westminster, will have charge of the Oconee Unit.

VICTOR F. CULLEN, M.D., of State Sanatorium, Md., was recently chosen President-Elect of the National Tuberculosis Association and WILL ROSS, Milwaukee, Wisc., was installed as President, for the 1945-1946 term.

FREDERICK G. GILLICK, M.D.,† has resigned as Chief of the Bureau of Venereal Disease in the District of Columbia Health Department to re-

\* Fellow A.P.H.A.

† Member A.P.H.A.

sume work with the U. S. Public Health Service.

#### CHANGES IN HEALTH OFFICERS IN NORTH CAROLINA

ALFRED MORDECAI, M.D., has been appointed Health Officer for the newly created Health Department for Davie, Yadkin, and Stokes Counties, with headquarters in Winston-Salem.

GILCIN F. MEADORS, JR., M.D.,† has resigned as Health Officer of Lenoir County to report to the States Relation Division of the U. S. Public Health Service, Washington, D. C., effective August 10.

HAMILTON W. STEVENS, M.D., Jacksonville, Director of the Onslow-Pender District Health Department, has resigned, effective September 30, to become Director of the Wilson City and County Health Unit.

WILSON T. SOWDER, M.D.,† of the U. S. Public Health Service, has been appointed Health Officer of Florida to succeed HENRY HANSON, M.D.,‡ Jacksonville, who retired Sept. 25.

S. EDWARD SULKIN, PH.D.,‡ has been promoted to a Professorship of Bacteriology and Immunology and has been made Chairman of the Department at the Southwestern Medical College, Dallas, Tex.

#### CHANGES IN HEALTH OFFICERS IN WEST VIRGINIA

At a special meeting of the Public Health Council in August, the following city and county health officers were appointed:

JAMES E. COLEMAN, M.D. (reappointed), Fayetteville, of Fayette County;

EDGAR H. WILLARD, M.D., Berkeley Springs, of Morgan County;

ROSCOE G. STOTTS, M.D., of Kenova;

JAMES A. MCCLUNG, M.D.,† of Richwood.

#### Western States

SAMUEL D. ALLISON, M.D.,\* for more than three years Control Officer of the Division of Venereal Diseases in the Board of Health, Territory of Hawaii, has been given a temporary appointment of Director of Public Health during the absence of DR. RICHARD K. C. LEE,† Honolulu, who has been given a year's leave for graduate study in New York.

WILL H. AUFRANC, M.D.,\* a regular corps officer, of the U. S. Public Health Service with rank of Surgeon, is on loan to the state of Oregon to act as Assistant State Health Officer. Dr. Aufranc also has charge of the County Health Units Program as well as the State Venereal Disease Control Program.

ELIZABETH BISHOP, M.D.,† of Baker, Ore., Health Officer of Union and Baker Counties, was recently elected President of the Oregon Public Health Association.

HUGH DIERKER, M.D., M.P.H.,† has resigned from the position of Chief of the Division of Industrial Hygiene for the Los Angeles County Health Department to assume the duties of Medical Director of the Southern California Division of General Motors Corporation in South Gate, Calif.

NIELS A. KAA, M.D., of Corvallis, Mont., has been appointed Health Officer of Ravalli County.

#### Canada

JOHN D. HAMILTON, M.D.,† of Montreal, P. Q., has been discharged from the Royal Canadian Army Medical Corps where he served as Major with the No. 1 Research Laboratory of the Canadian Army, to assume the position of Assistant Professor of Pathology at the University of McGill, Montreal, Canada.

\* Fellow A.P.H.A.

† Member A.P.H.A.

# American Journal of Public Health

## and THE NATION'S HEALTH

---

Volume 35

December, 1945

Number 12

### A Twenty-five Year Review of the Work of the Committee on Administrative Practice

WILTON L. HALVERSON, M.D., F.A.P.H.A.

*Chairman, Committee on Administrative Practice, A.P.H.A., and  
California State Health Officer, San Francisco, Calif.*

THE 25th birthday of the Committee on Administrative Practice seems a fitting time to take a backward look at its history, evaluate its accomplishments, and explore the avenues of its usefulness in the immediate future. It was in 1920 that the committee was first organized, having its immediate roots in the 1915 studies of state health departments by Dr. Charles V. Chapin, and in the interest of the Metropolitan Life Insurance Company in "the character of the organization of municipal health departments." The Metropolitan, through the interest of its inspired statistician, Dr. Louis I. Dublin, provided the earliest funds for the work of the committee. Dr. Dublin was the first secretary of the committee, a post he filled with distinction for 15 years.

The history of great movements is the history of great men. This is no less true of the Committee on Administrative Practice. For the first 15 years of its pioneering existence, during which it laid the foundations of enduring in-

fluence upon public health in the United States, Dr. C.-E. A. Winslow served as its mentor. His devoted and informed service and that of a relatively small group similarly blessed with wisdom and foresight, such as Drs. Charles V. Chapin, Haven Emerson, Allen W. Freeman, George T. Palmer, W. S. Rankin, Henry F. Vaughan and W. Frank Walker, among others, were so productive that at the end of this period he was able to say, "In the first 15 years of life of the committee it has been possible to attain in considerable degree all of our five major objectives."

These five major objectives were at that time so clearly stated that they bear summarizing:

1. Secure authentic information as to the actual practice of American communities in the field of health organization.
2. Utilize the information in the form of a typical community health program which might be set up as a norm or as a general guide to be used by any community which aspires to provide adequate health protection for its citizens.
3. Devise a method by which the health-

officer may appraise the results obtained by his program.

4. Make results of surveys, standards of administrative practice, and appraisal procedures directly available to health officers.

5. Secure popular support for public health programs by using the appraisal scheme to arouse local interest in health achievement.

The study of municipal health department practices in the 100 largest cities of the United States and the report of the study, the development of an appraisal form and its use by cities and later by rural health units, the stimulation of interest through the annual Health Conservation Contest with the active coöperation of local chambers of commerce—these are now familiar ways in which the five objectives were carried out. At the end of the first 15 years, thus, the evaluation process and the formulation of administrative standards had been carried to a high degree of development.

The Greek admonition to "know thyself" was further expressed in those early days by local and state health departments. The Committee on Administrative Practice early saw the value of a field consultant service which should be available for surveys and consultations to health officers. The first of such surveys was made in 1924 when 5 cities were studied—Charleston, S. C., Kansas City, Kan., Memphis, Syracuse, and Wilkesbarre. This number grew steadily until 18 cities or counties were surveyed or resurveyed in 1929. In 1925, Texas became the first state to be studied by the committee's field staff. In the years since 1924, a total of 151 surveys in Continental United States have been made, 17 of which were of state departments or of some aspect of state health service. In addition three surveys have been made in Alaska and Hawaii, and three in Canada. These surveys vary widely; many are thorough-going evaluations, with recommendations, of all health activities of a state, municipal, or

county department as, for example, the Florida, California, and Illinois state or the Louisville, Washington, or Wilmington city surveys. Others might be a brief extension of the analysis of the appraisal form with recommendations. Still others are related to a single problem such as medical care of the indigent, tuberculosis, the sanitary code, outpatient services, etc.

The auspices under which such surveys are made also show a great variety. Often, perhaps most frequently, they are requested and paid for by the local or state boards of health as an earnest of their desire to apply the best available tests of performance to their health programs. Often the analysis of health activities is part of a larger survey of health and welfare services, both voluntary and official, and is initiated either by the local council of social agencies or perhaps by the national Community Chests and Councils. Here the emphasis is not only upon the health department performance, *per se*, but upon its integration with the total community effort. In a number of instances the surveys have been made as a part of experimental projects in the community, notably the annual evaluations made for the five year child health demonstration projects carried on by the Commonwealth Fund between 1924 and 1929 in four widely diversified communities of the United States.

These studies have immeasurably improved the architecture of public health administration throughout the country. California, Michigan, and Illinois State Health Departments, to cite examples, bear the imprint of the searching and courageous appraisal both of strength and of weakness by the committee's field staff. As a further example, *Time Magazine* of January 18, 1937, in discussing the Arizona survey said, "Boosters of Arizona as a health resort were last week obliged to

swallow a bitter purge compounded by Dr. Buck of the American Public Health Association." As a result, the legislature was immediately petitioned for a full-time health commissioner for the state and for each county and large city, with power to deal with water supply, sewage disposal and all other environmental factors.

Los Angeles County was studied in 1928 and again in 1937. In the latter year the authors were able to say "An analysis has shown that approximately 77 per cent of the many practical recommendations made by the 1928 survey have been carried out, either in whole or in part." When one remembers that these years encompass the great depression, this is a truly remarkable tribute both to the surveyor and the surveyed.

And what are some of the recommendations that have come out of these studies? By no means has the primary recommendation been for the expenditure of more money. Rather has the emphasis been upon putting the administrative house in order, upon divorce from political considerations, upon Merit System standards and tenure, upon proper balance of activities, upon attack on the "sore spots" in the local health picture, be they infant or maternal mortality, tuberculosis, malaria, hookworm, venereal diseases, or occupational diseases, and upon the use of administrative techniques that have currently been found most useful in dealing with tuberculosis, scarlet fever, syphilis and other diseases. The mere spending of money without the correction of administrative anomalies is never recommended.

The last ten years of the committee have seen the maturing of the evaluation process and its implementation. Starting in 1929 with the now familiar techniques of mass education, the Health Conservation Contest and later the National Health Honor Roll made

the grass roots conscious of their own local health organizations. Sponsored by the U. S. Chamber of Commerce and local chambers it made use of the competitive spirit among cities and other local units of government. This technique served its primary purpose of focusing citizen attention on local health problems admirably, but it was inevitable that it should eventually have wider implications. The Honor Roll was discontinued in 1943. Succeeding it is the Reporting Area for Health Practices and *Health Practice Indices*, the 1943 edition of which was based upon 178 local health departments in 31 states and 4 Canadian provinces. The 1943 population served by the 168 departments in the United States was estimated to be 17,857,800, or 13 per cent of the total. In 1944 the number of departments increased to 233, representing more than one-sixth of the total population. In contrast, the first ten years (1880-1889) of the death registration area of the United States Bureau of the Census covered only Massachusetts, New Jersey, and the District of Columbia, or about 6 per cent of the population. The birth registration area started 35 years later in 1915 with about one-third of the population.

The Health Reporting Area is made up of those communities—cities, counties, or health districts—that prepare an evaluation schedule of the year's activities of the departments for use in building up the annual health practice indices. The emphasis is no longer upon a good or bad score as in the days of the competitive Health Contest or Honor Roll, but upon health protection in the community as a whole, on measurement of results rather than of mere activity. The evaluation schedule measures both needs and resources and the degree of success in which resources have been applied to needs.

The evaluation process has many

uses. Locally it is useful as an appraisal of the success with which the community meets its health needs, as a basis for budget making or annual reports, and as a basis for developing new programs. For the state departments of health it provides a basis for evaluating problems and programs in local health units, for determining budget allocations, and for indicating the supplementary services needed. Nationally it gives to the Public Health Service, the Chamber of Commerce, medical, labor, and management groups, an opportunity of observing a cross-section of the nation's health problems and practices. And finally it is a useful tool in the teaching of public health administration in schools of public health.

A significant outgrowth of the committee's attempt to codify, as it were, accepted public health practices came with the publication of a statement entitled, "Desirable Minimum Functions and Organization Principles for Health Activities." This has been officially adopted by the Association. Here is outlined the principle of local responsibility, supplemented by state and federal consultant and financial aid; here are outlined the six basic functions of a local health department; and here also are the hints of the future planning and responsibility that are now coming into the local health officer's area of activity. Not only has this statement, prepared by the Committee on Administrative Practice, had its influence in this country; the ripples of its effect have been visible in many other parts of the world. For example, it has been reported to be one of the two main sources of inspiration in the recent planning for the reorganization of health services in India.

After studying local health services, both through the growing evaluation process and through committees on health department practices, it began

to be evident in the late 30's that one of the stumbling blocks in the way of the universal development of good local health administration was the chaotic situation whereby legal responsibility for local health service is vested in thousands of overlapping jurisdictions. It began to be painfully obvious that many of these jurisdictions would never fulfil their responsibilities because their population and other resources were so small that not even minimum service could be afforded. It was further evident that the movement for full-time county organization was progressing far too slowly for the same reason that, by and large, the population of individual counties is too small to support such a service. And although many areas, particularly cities, had developed local health departments of high standards and accomplishment, nevertheless, one-third of the population was without the services of a full-time local health officer.

In 1942, therefore, spurred also by resolutions of the American Medical Association and the American Public Health Association, the Committee on Administrative Practice appointed a Subcommittee on Local Health Units and charged it to explore the possibilities of making a blueprint for the administrative organization of local health services on at least a minimum basis that would cover every person in every county of every state and yet retain the advantages of local rather than of state or federal control. Fortunately for the work of the committee, Dr. Haven Emerson accepted the chairmanship, bringing to it not only his experience as administrator, teacher, and surveyor of health departments both in America and abroad, but his talents for discussion, persuasion, hard and unremitting work, and cutting through a forest of details to see the essential picture and see it whole, and his conviction with regard to the importance of local participation

in essential health services. All these he needed in developing a diagram of the existing situation with respect to local health administration—the legal framework, personnel and expenditures—and in working out with the state health officers of the 48 states an acceptable plan whereby each state might have local health service through administrative units made up of one or more counties and their contained cities, and containing a minimum population of approximately 50,000 persons.

The current results of this committee's work were recently published as *Local Health Units for the Nation*, by the Commonwealth Fund, which indeed made the work of the committee possible by its generous grants. I venture the prediction that this study will be as far-reaching as the first study of the parent committee, namely, "Health Practices in the 100 Largest Cities of the United States." In a very special way the recent report represents the culmination of the evaluation process; first, the analysis of existing situations, then the development of criteria, and finally the administrative framework upon which desired objectives can be built.

This subcommittee recommends that the United States can be served with respect to local health functions through fewer than 1,200 administrative units, each under the direction of a full-time medically trained health officer assisted by the necessary clinical, sanitary, public health nursing, clerical, and other personnel. It believes further that the basic essentials of such a service can be provided for approximately one dollar per capita, and that even an optimum service ought to cost not more than \$2.50 per capita.

This report is the post-war plan for public health. Here are the facts as to organization needed and the personnel that will be required. It represents the architect's drawing for the

main building of local public health of the future, so designed that additions can be made to meet changing conditions without destroying its fundamental structural and functional beauty. This is a plan for increasing local responsibility and performance through administrative machinery adapted to present conditions, rather than for state or federal assumption of local responsibilities.

The evaluation process had also been discovering another stumbling block in "preventing sickness and achieving a high level of public health," which I take to be the purpose of all health service on whatever level of government. The lack of medical care was often found to create the public health problems with which local health departments are concerned. Hence while the Subcommittee on Local Health Units was perfecting an administrative pattern for carrying out whatever might now or in the future be the accepted functions of a local health department, another subcommittee, that on Medical Care, was suggesting an addition to the six long-accepted functions. The Subcommittee on Organized Care of the Sick was in existence between 1921 and 1935, and concerned itself chiefly with the relations between health departments and hospitals and with surveys of hospital and clinic facilities in relation to the local health department.

In 1939 this subcommittee was reorganized. By that time the new official climate in Washington and the nation generally with respect to public welfare services led the committee to focus its attention on a definition of the local health department's responsibility to the large portion of the population that receives insufficient and inadequate medical care, either because they are unable to pay the cost of care or because the services are not available. The unhappy findings of Selective Service examinations gave further



urgency to this problem. After a period of intensive study and discussion, this group, whose name had in 1943 been changed to Subcommittee on Medical Care, with Dr. Joseph W. Mountin of the Public Health Service as chairman, the following year presented to the parent committee and in turn the Governing Council of the Association "a set of principles expressing the desirable content of a comprehensive program of medical care, the methods of its administration, and the part which public health agencies should take in its operation." As a result, Medical Care in a National Health Program, an Official Statement of the American Public Health Association, was adopted by the Governing Council on October 4, 1944. Its content is too well known to need repeating here, except to review the objective of a national program for medical care that should make available to the entire population all essential preventive, diagnostic, and curative services of the highest standard, and rendered under conditions satisfactory both to the public and to the medical professions, and the recommendation that the public health agencies—federal, state, and local—should carry major responsibility in administering the health services of the future. Whether or not one agrees with the methods suggested for providing the required services or with the agencies designated for their administration, it is significant that the problem was placed before and acted upon by the Association.

The discussions go on at present in Congress with respect to a hospital construction plan that shall replace the present haphazard and highly inequable distribution of hospital facilities among the various parts of the country, and the responsibilities that state and local health officers will be called upon to meet in the development of this program, indicate how important it is that

there should already be rather general agreement on the best techniques for carrying out currently recognized responsibilities. Without the last 25 years' work of the C.A.P. we should indeed be in sorry arrears as to our preparedness in meeting the new tasks ahead and the unique problems that will be created by returning personnel from the wars and the returning veteran with his need of physical and mental rehabilitation and his demand, quite properly, that there shall be no submerged one-third as to health protection.

These same developments point the way to the work ahead for the C.A.P. Events transpiring as this is written are changing the world overnight even more radically than air transportation did during the last generation. Nothing is clearer than that new methods must constantly be devised to meet new situations in public health no less than in other areas of human activity. The evaluating and originating process of the committee must go on, so that techniques no longer useful will be discarded and newer practices developed to meet changing and expanding needs. For example, although many of the more common communicable diseases no longer bulk large among public health problems, and it is reasonable to hope that tuberculosis can be entirely eliminated within another generation, the problems of chronic illness have hardly begun to be understood or faced. Here is a field for the combined talents of the researcher, clinician, health educator, the nutritionist, as well as for various study committees on Evaluation of Administrative Practice. And as long as accidents in home and factory continue to be more deadly than the lethal weapons of war, the Subcommittee on Accident Prevention will find more than enough to challenge its energy and ingenuity.

I cannot close without a brief refer-

ence to the many persons and agencies who have made the work of the committee possible—members of the committee, field staff, and financial backers. Reference has already been made to Dr. Winslow's unique service of 15 years as chairman of the committee. In the last ten years the committee has had three chairmen. Between 1936 and 1941, Dr. Eugene L. Bishop, with his experience as Tennessee State Health Officer and later pioneering as Medical Director of the Tennessee Valley Authority, provided the committee's leadership. In the next two years Dr. Henry F. Vaughan, at that time Health Commissioner of Detroit, and now Dean of the Michigan School of Public Health, brought to the service of the committee his very considerable talents and his long experience in the yeasty atmosphere of Detroit, Battle Creek, and Ann Arbor. These three chairmen—Dr. Winslow, Dr. Bishop, and Dr. Vaughan—have set a rare standard of accomplishment for me and others who follow them.

Dr. Dublin, in discussing the first 15 years of the committee's history, paid more eloquent tribute than I have words for to the early field staff—Dr. Rankin and his creation of the *Appraisal Form*, and Dr. Walker and his inauguration of the survey work of the committee and the launching of the Health Conservation Contest. More recently the committee has been fortunate in having the continuous services of Dr. Carl E. Buck for what will shortly be 15 years as Field Director. During these years he has been fearless in his analyses of health departments. It is greatly to his credit that the National Health Honor Roll has graduated into the less picturesque but more solid Health Practices Reporting Area. A lesser man might easily have been satisfied with letting a successful project continue indefinitely without seeing its wider implications. Nor can I pass by

without special mention of Dr. George T. Palmer, who for many years as a member of the committee, and for the last two years as Associate Field Director, has served the cause of public health both wisely and well. The Public Health Service is indeed fortunate that personal considerations have taken him to Washington, but for the committee it is a grievous loss that will not easily be made up.

Mention has already been made of the early financing of the committee's work by the Metropolitan Life Insurance Company. Through Dr. Dublin's efforts other insurance companies\* helped in financing the City Health Conservation Contests. The U. S. Chamber of Commerce gave local and national promotional help. When the Contest plan was extended to rural areas the Kellogg Foundation provided the funds, giving a total of about \$200,000 for this purpose. Since 1928 the Commonwealth Fund has contributed continuously and generously for several committee activities, with a total of about \$275,000. It has also published for the committee, Dr. Freeman's *A Study of Rural Health Service*, Dr. Hiscock's *Community Health Organization*, and Dr. Emerson's *Local Health Units for the Nation*. Beginning in 1925 the Milbank Memorial Fund over a period of five years made a grant of \$40,000 for the development of the *Appraisal Form*. During the life of the committee, grants from these and other agencies have totaled nearly three-quarters of a million dollars. Thus in a real sense the committee's 25 year activities have been coöperative ventures shared in by other national agencies with an interest in the development of adequate health protection for every community.

---

\* The insurance companies contributing \$1,000 or more for this purpose are: Prudential, Travelers, Aetna, John Hancock, New York Life, and Equitable Life.

# Recent Trends in the Early Diagnosis of Tuberculosis

EDWARD X. MIKOL, M.D., M.P.H., AND  
ROBERT E. PLUNKETT, M.D.

*Clinic Physician, and General Superintendent of Tuberculosis Hospitals,  
Division of Tuberculosis, New York State Department of Health,  
Albany, N. Y.*

THROUGHOUT the fifty years of the organized campaign against tuberculosis, a constant point of emphasis has been the importance of early diagnosis of the disease. Much of the work of public and private tuberculosis agencies has been directed toward that goal. Complete justification for such emphasis is the abundant evidence that early diagnosis means better prognosis, less disability, shorter duration of treatment, less economic hardship to the patient, lower cost of the disease to the community, and less opportunity for the transmission of infection.

The main purpose of this report is to review the trend of early diagnosis in New York State, exclusive of New York City, during a period of twenty years, as indicated by the stage of disease of newly reported cases of respiratory tuberculosis. It is of special interest to note certain striking changes which have occurred in recent years and to discuss the probable relationship of these changes to other recent events in tuberculosis control, notably the expansion of case finding through mass chest x-ray examinations of apparently healthy adults.

At the same time, it is believed that this study represents a means of adding

to the knowledge of tuberculosis morbidity in general. In the past, much of the basic knowledge about the disease has been provided by analyses of tuberculosis mortality data. Relatively little similar information is available about morbidity. The material here presented constitutes a preliminary step toward providing more facts about the living cases.

## MATERIAL USED

The geographic area represented is that known as "upstate New York," which includes all of New York State except the five boroughs which comprise New York City. The area includes 57 counties, ranging in size of population from 3,395 to 851,690, with a total estimated population in 1944 of 6,179,921.

Reporting of tuberculosis cases has been required by law in upstate New York since 1908. All official case reports, regardless of their place of origin (private physician, clinic, hospital, etc.), are ultimately filed in the Division of Tuberculosis of the State Department of Health. Since 1924, the annual reports of this division have contained an analysis of the cases reported each year, including the distribution of all cases according to age,

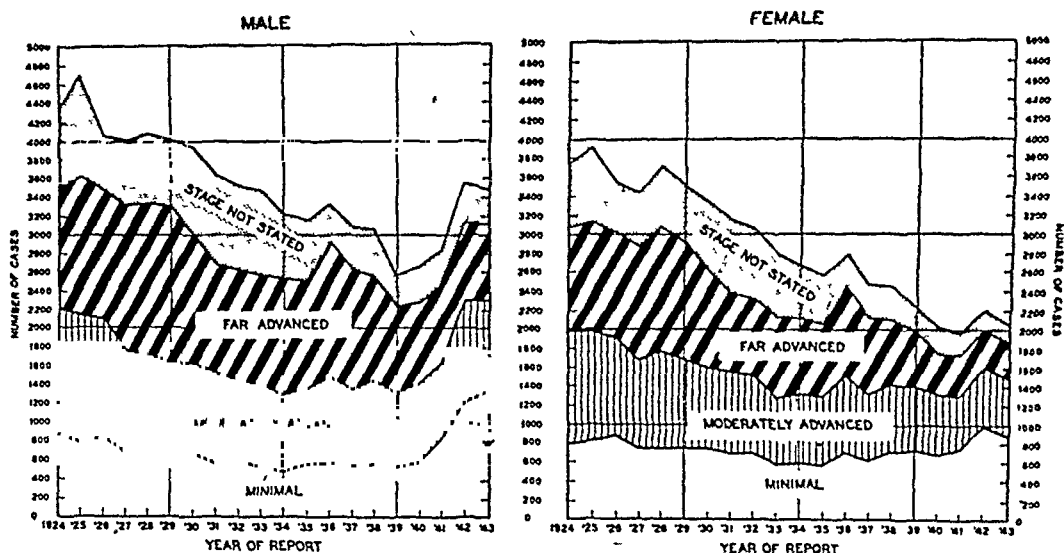


FIGURE 1—Number of reported cases of respiratory tuberculosis by sex and stage of disease, New York State, exclusive of New York City, 1924–1943

sex, and form (site) of the disease, and the distribution of the respiratory\* cases according to age, sex, and stage of disease. The data for the respiratory cases reported during each of the twenty years from 1924 through 1943 were used in the preparation of this report. Non-respiratory cases were not considered, since the primary object was to study the trend of early diagnosis as shown by the stage of disease of respiratory cases, and the standard classification of stage of disease (minimal, moderately advanced, and far advanced) is, of course, applicable only to respiratory cases. It is of incidental interest, however, that the proportion of non-respiratory cases among all cases steadily decreased from about 12 per cent in 1924 to about 5 per cent in 1943.

A classification of the cases according to race was not considered necessary because the non-white racial

groups constitute only 2.0 per cent of the upstate population, and only a relatively small proportion of the total cases occur among them, as for example, 6.5 per cent in 1943.

There are, of course, several other characteristics of reported cases which are of considerable importance from an administrative standpoint, such as sputum status, source of report, and time of reporting in relation to death, but these are not considered in this report.

#### RESULTS

The results of the study are presented by means of two sets of analyses:

1. Respiratory cases according to sex and stage of disease
2. The cases in each stage according to age and sex

#### *Respiratory cases according to stage of disease*

Figure 1 shows on a cumulative basis for each of the twenty years and for each of the two sex groups the number of reported cases of respiratory tuberculosis in each stage; the topmost curves thus represent the total number of respiratory cases reported each year in

\* The term "respiratory" is used instead of the more common term "pulmonary" because the cases considered include some which are not strictly pulmonary, such as tuberculous pleurisy with effusion, tuberculosis of the trachea or bronchi (without mention of parenchymal involvement), and tuberculosis of other parts of the respiratory system, exclusive of the lungs.

TABLE 1

*Number of Reported Cases of Respiratory Tuberculosis by Sex and Stage of Disease, New York State, Exclusive of New York City, 1924-1943*

Year	Male					Female				
	Total	Minimal	Moderately Advanced	Far Advanced	Stage Not Stated	Total	Minimal	Moderately Advanced	Far Advanced	Stage Not Stated
1924	4,338	864	1,364	1,272	838	3,741	792	1,190	1,083	676
1925	4,692	784	1,370	1,468	1,070	3,896	819	1,161	1,143	773
1926	4,057	842	1,264	1,356	595	3,538	874	1,035	1,112	517
1927	4,000	688	1,081	1,564	667	3,428	756	912	1,199	561
1928	4,074	654	1,063	1,630	727	3,707	744	1,032	1,289	642
1929	4,019	679	948	1,673	719	3,508	742	950	1,221	595
1930	3,945	656	969	1,356	964	3,343	741	859	1,006	737
1931	3,629	565	958	1,148	958	3,148	680	883	824	761
1932	3,523	572	867	1,181	903	3,058	691	829	797	741
1933	3,485	531	866	1,178	910	2,793	592	694	841	666
1934	3,212	474	813	1,233	692	2,658	590	723	811	534
1935	3,160	550	810	1,152	648	2,573	577	704	767	525
1936	3,329	560	913	1,441	415	2,789	691	823	941	334
1937	3,092	530	825	1,263	474	2,470	612	712	802	344
1938	3,078	556	885	1,112	525	2,459	706	708	682	361
1939	2,554	518	791	902	343	2,211	722	677	588	224
1940	2,642	577	822	873	370	2,021	687	623	451	260
1941	2,811	797	831	817	366	1,974	733	565	442	234
1942	3,534	1,206	1,084	830	414	2,203	976	625	394	208
1943	3,492	1,326	976	807	383	2,040	870	571	407	192

each sex group. The actual number of cases reported each year by sex and stage of disease is shown in Table 1.

Considering first the total number of cases reported each year, the following observations are noteworthy:

1. In each year the total number of cases was higher among males than among females.

2. Except for three interruptions,\* the total number of cases decreased progressively from 1924 through 1939 in males, and from 1924 through 1941 in females.

3. The total number of cases among males began an upward trend in 1940, reaching a peak in 1942, with but a slight subsequent

decrease in 1943. By 1942 the number of cases among males was 38 per cent higher than that in 1939, before the upward trend began (Table 1).

4. The total number of cases among females increased in 1942, dropping back in 1943 approximately to its 1940 level. The 1942 figure was 12 per cent higher than that in 1941 (Table 1).

In other words, following a long period in which the total number of cases was almost steadily declining in both sexes, a change in the trend has occurred in the recent years.

Turning to the distribution of cases according to the stage of disease, the number of cases reported in each stage, by sex, is shown in Figure 1 and Table 1. In addition, Figure 2 and Table 2 show the trend of the percentage distribution of reported cases by stage for each sex. The recent trends in the number of cases reported in each stage (minimal, moderately advanced, and far advanced) may be more clearly seen from the topmost curves in Figures 3, 4, and 5, respectively.

Outstanding is the marked increase in the number of minimal cases among

\* 1925—The sharp peak in the number of cases in both sexes was a spurious one; in that one year, all report cards received, including those of previously reported cases, were included in the tabulations, instead of only those of cases reported for the first time.

1928—The total number of cases reported was higher than in the previous year, notably in females; this increase may have resulted from the sending of a personal letter by the Director of the Division of Tuberculosis to every physician in the upstate area requesting that all known cases be reported.

1936—The sharp increase in the number of cases in both sexes was incidental to the opening of three new district state tuberculosis hospitals in that year, and the simultaneous inauguration of decentralized, more frequent field chest clinics in the area served by these hospitals.

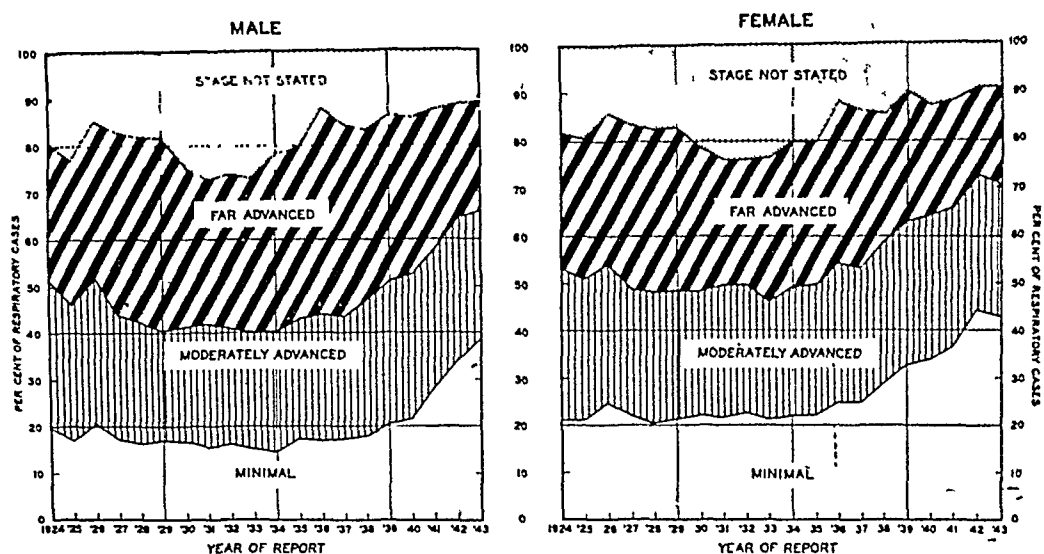


FIGURE 2—Percentage distribution of reported cases of respiratory tuberculosis by stage of disease, according to sex, New York State, exclusive of New York City, 1924–1943

males in recent years, the number in 1943 being 156 per cent higher than that in 1939 before the increase began. It was largely the increase in minimal cases which accounted for the increase in the total number of cases among males.

Even more striking is the change in the *relative* number of minimal cases among males, as shown in Table 2 and

Figure 2. During the 16 years from 1924 through 1939 the percentage of minimal cases among males remained constantly at or below 20 per cent of the total cases in this sex group. Then, the percentage increased each year from 21.8 in 1940 to a peak of 38.0 in 1943. The proportion of minimal cases was thus almost doubled in the last 5 years.

TABLE 2  
Percentage Distribution of Reported Cases of Respiratory Tuberculosis by Stage of Diseases, According to Sex, New York State, Exclusive of New York City, 1924–1943

Year	Male					Female				
	Total	Minimal	Moderately Advanced	Far Advanced	Stage Not Stated	Total	Minimal	Moderately Advanced	Far Advanced	Stage Not Stated
1924	100	19.9	31.4	29.3	19.3	100	21.2	31.8	28.9	18.1
1925	100	16.7	29.2	31.3	22.8	100	21.0	29.8	29.3	19.8
1926	100	20.8	31.2	33.4	14.7	100	24.7	29.3	31.4	14.6
1927	100	17.2	27.0	39.1	16.7	100	22.1	26.6	35.0	16.4
1928	100	16.1	26.1	40.0	17.8	100	20.1	27.8	34.8	17.3
1929	100	16.9	23.6	41.6	17.9	100	21.2	27.1	34.8	17.0
1930	100	16.6	24.6	34.4	24.4	100	22.2	25.7	30.1	22.0
1931	100	15.6	26.4	31.6	26.4	100	21.6	28.0	26.2	24.2
1932	100	16.2	24.6	33.5	25.6	100	22.6	27.1	26.1	24.2
1933	100	15.2	24.8	33.8	26.1	100	21.1	24.8	30.2	23.8
1934	100	14.8	25.3	38.4	21.5	100	22.2	27.2	30.5	20.1
1935	100	17.4	25.6	36.5	20.5	100	22.4	27.4	29.8	20.4
1936	100	16.8	27.4	43.3	12.5	100	24.8	29.5	33.7	12.0
1937	100	17.1	26.7	40.8	15.3	100	24.8	28.8	32.5	13.9
1938	100	18.1	28.8	36.1	17.1	100	28.7	28.8	27.7	14.8
1939	100	20.3	31.0	35.3	13.4	100	32.7	30.6	26.6	10.1
1940	100	21.8	31.1	33.0	14.0	100	34.0	30.8	22.3	12.9
1941	100	28.4	29.6	29.1	13.0	100	37.1	28.6	22.4	11.9
1942	100	34.1	30.7	23.5	11.7	100	44.3	28.4	17.9	9.4
1943	100	38.0	27.9	23.1	11.0	100	42.6	28.0	20.0	9.4

Among females, the increase in the total number of cases in 1942 was also due largely to an increase in minimal cases, and in this sex group too there was an increase in the percentage which the minimal cases constitute of the total cases, except that the increase began earlier than that among males. In females the percentage of minimal cases was below 25 per cent from 1924 through 1937. It then rose from 28.7 per cent in 1938 to a peak of 44.3 in 1942, decreasing slightly in 1943 (Table 2 and Figure 2).

These changes in the percentage of minimal cases obviously must be considered in relation to the percentage of cases in the other stages.

In males the number of moderately advanced cases was higher in 1942 and 1943 than in the preceding several years. In females there was a very slight though not significant increase in moderately advanced cases in 1942.

However, the *percentage* of moderately advanced cases in both sex groups has remained fairly constant between 25 and 30 per cent, not only in the recent years, but during the entire 20 year period (Table 2).

The actual number of far advanced\* cases in both sex groups decreased only slightly during the last few years (Table 1), but their relative number, or percentage, showed a definite decrease. In males the percentage of far advanced cases prior to 1940 was generally above 35 per cent, whereas in 1942 and 1943 it was only about 23 per cent. Similarly, in females, prior to 1938 this percentage was generally above 30, with a decrease to 18 per cent in 1942 and 20 per cent in 1943 (Table 2).

These decreases in the percentage of far advanced cases, in the light of the increases in the total number of cases

reported, represent an encouraging trend, of course.

The group designated as "stage not stated" requires some explanation. This term is partly a misnomer because the group includes not only those cases with parenchymal disease of the reinfection type for which the stage was not specified, but also other respiratory cases to which a classification according to stage of disease is not applicable, such as tuberculous pleurisy, tuberculosis of the trachea or bronchi, and others.

From 1924 through 1935 all cases of primary tuberculosis ("juvenile tuberculosis," "hilar tuberculosis," "childhood tuberculosis," etc.) were included in the "stage not stated" group. Since 1936 such cases have been excluded entirely from the respiratory cases, except that in 1938 they were erroneously so tabulated and placed in that year among those with "stage not stated."

In addition to these changes in the method of tabulating cases of primary tuberculosis, during the 20 years there were also changes from time to time in the degree of emphasis placed upon the reporting of such cases. For example, a recommendation by the Division of Tuberculosis in 1932 that cases of healed primary tuberculosis should not be reported was followed by a steady decrease in their number in the next few years.

Among males the number of cases in the "stage not stated" group increased slightly in 1942. However, in both sex groups, the percentage of such cases decreased in the recent years. As indicated above, the changes in the size of this group of cases were partly due to changes in administrative recommendations regarding reporting and in statistical methods of tabulation. However, the latter factors did not account for the remarkable reversal in the trend of the minimal cases, not only because of the extent and duration of that reversal but also because the administrative changes did not occur at the time of the reversal.

#### *Cases according to stage of disease and age*

A study of the distribution of the minimal, moderately advanced, and far advanced cases in each sex group ac-

\* This group includes cases of acute military tuberculosis.

cording to the age at the time of reporting reveals not only further details concerning the recent trends in early diagnosis but also certain important age and sex characteristics of tuberculosis morbidity in general. In classifying the cases according to

age, the group 20-34 years of age was included in order to determine whether the reporting of cases in this group was affected by the large-scale chest x-ray examinations of candidates for the armed forces in recent years. *Minimal cases*—Figure 3 shows the

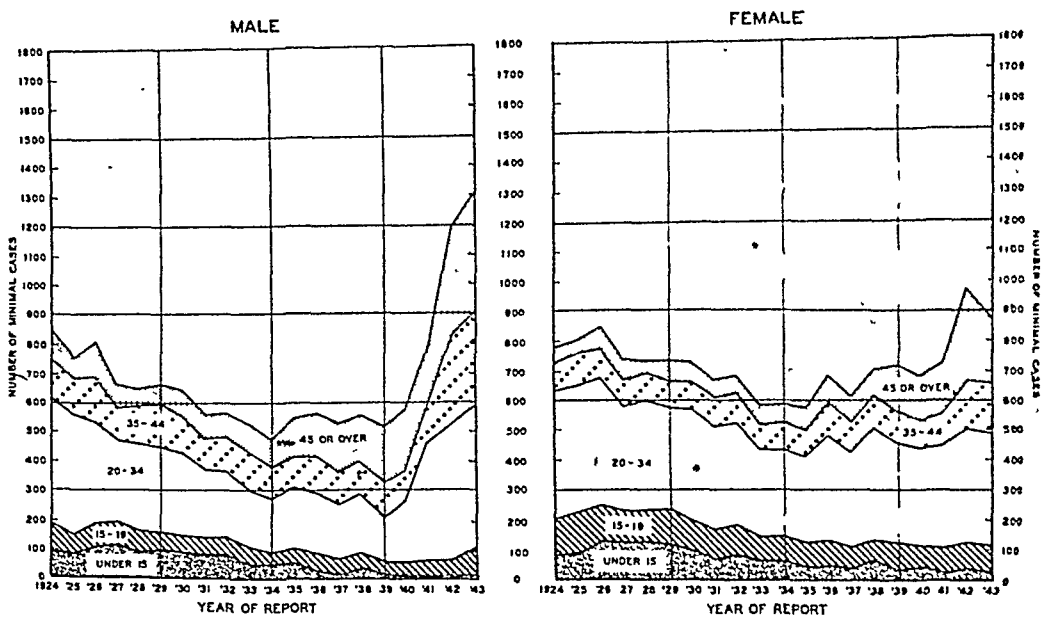


FIGURE 3—Number of reported cases of *minimal* respiratory tuberculosis by sex and age, New York State, exclusive of New York City, 1924-1943

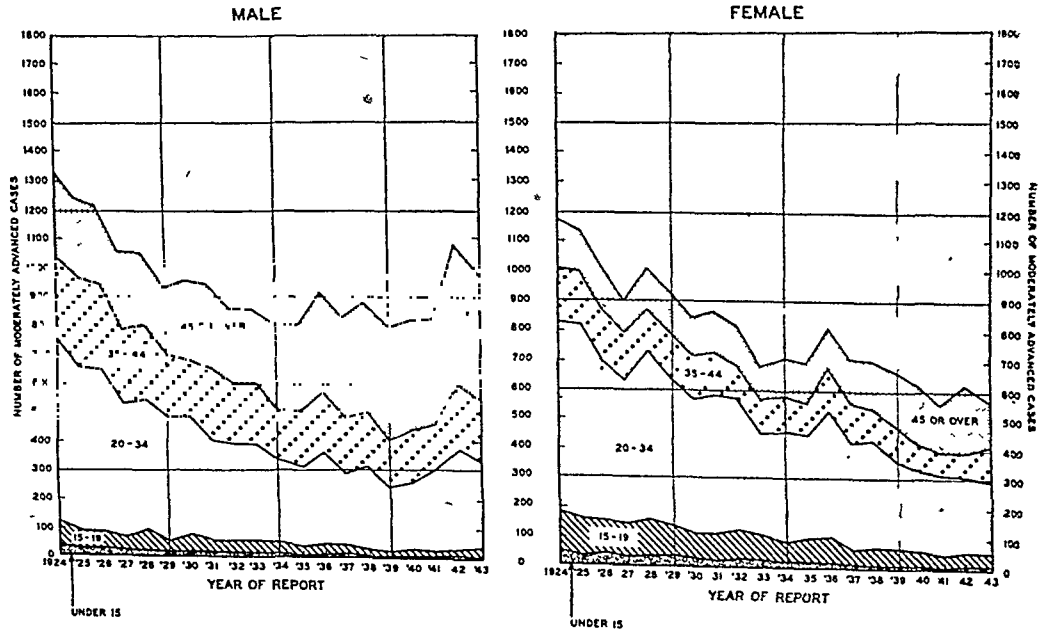


FIGURE 4—Number of reported cases of *moderately advanced* respiratory tuberculosis by sex and age, New York State, exclusive of New York City, 1924-1943



number of minimal cases in each sex group, on a cumulative basis by age. The topmost curve represents the total number of minimal cases reported and thus corresponds to the curve for minimal cases in Figure 1, though the vertical scales in these two graphs are different.

The salient facts revealed by Figure 3 are the following:

1. Prior to 1941 there were more minimal cases among females than among males.

2. As previously mentioned, in 1941 there was a sharp and striking increase in the number of male cases which continued progressively during 1942 and 1943.

3. The data for the separate age groups in males indicate that the increase in the total number of minimal cases in the last 3 years was due largely to (a) a marked increase in the number of cases in the 20-34 age group, and (b) smaller increases in 1942 and 1943 in the number of cases in the 35-44 and the 45-or-over age groups.

4. Among females the total number of minimal cases showed an irregular trend through 1941, then increased sharply in 1942, and remained comparatively high in 1943, though lower than in 1942.

5. In contrast to the situation among males, the minimal cases in females in the age group 20-34 did not increase in 1942 and 1943 when the total cases increased. Rather, the increases were in the age groups over 35.

The foregoing differences between males and females in the extent and the age characteristics of the recent change in minimal cases represent one of the highlights of this study.

*Moderately advanced cases*—Figure 4 shows the number of moderately advanced cases in each sex group, on a cumulative basis by age. The topmost curve represents the total number of moderately advanced cases reported.

1. In contrast to the sex distribution of minimal cases, the number of moderately advanced cases among males was higher than that among females in practically all of the 20 years.

2. As previously noted, the total number of moderately advanced cases increased appreciably among males in 1942 and 1943, and slightly among females in 1942.

3. The increase in the total number of moderately advanced cases in males was due to approximately equal relative increases in all three of the age groups over 20.

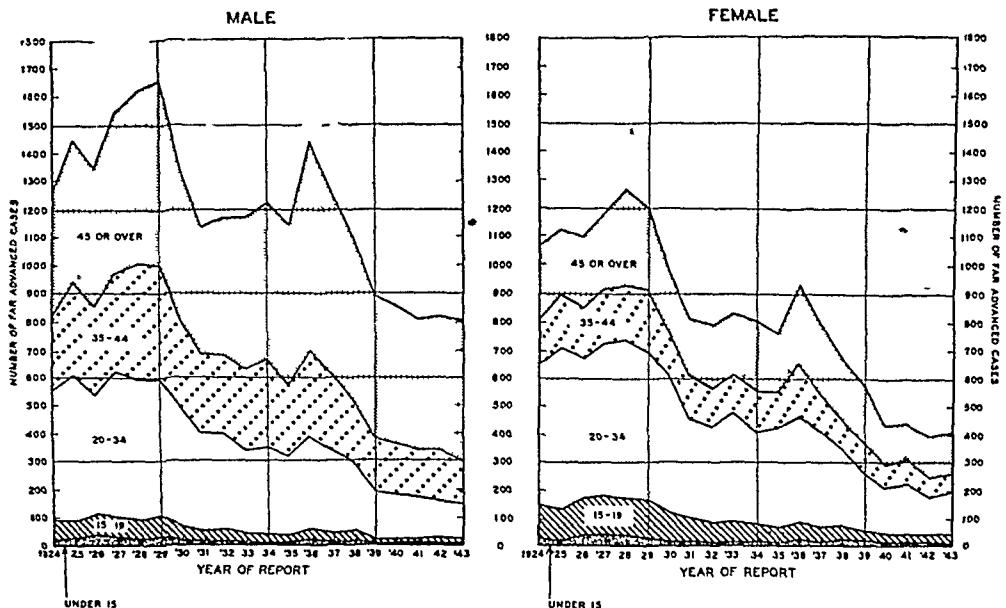


FIGURE 5—Number of reported cases of far advanced respiratory tuberculosis by sex and age, New York State, exclusive of New York City, 1924-1943

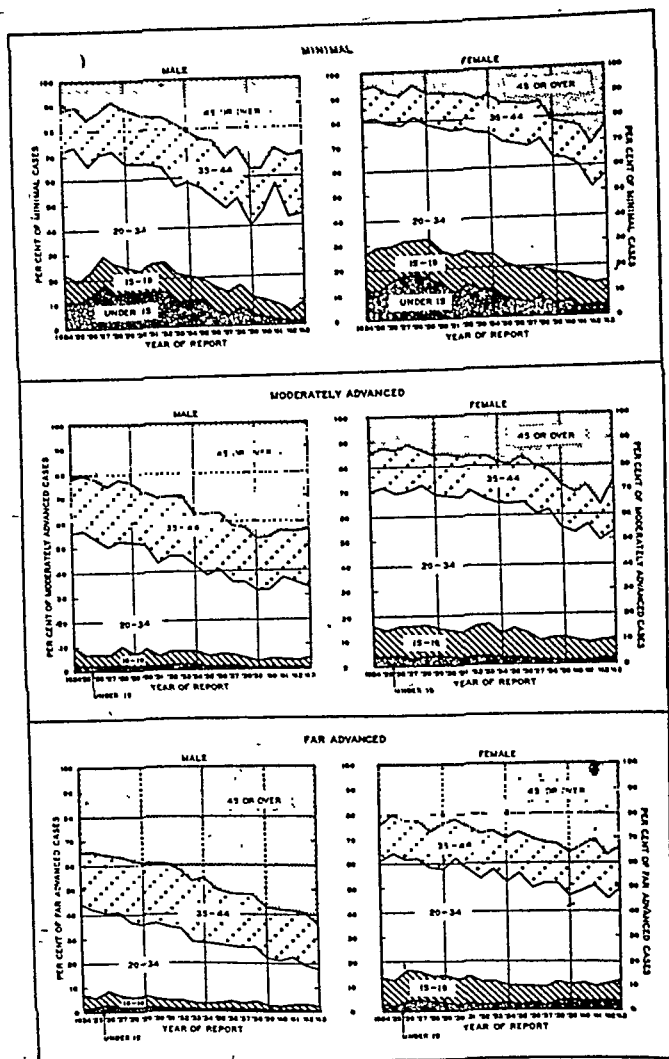


FIGURE 6—Percentage distribution by age of reported cases of respiratory tuberculosis in each stage of disease, according to sex, New York State, exclusive of New York City, 1924-1943

4. The slight increase in the number of female cases in 1942 was due almost entirely to an increase in the number of cases among those 45 years of age or over.

*Far advanced cases*—Figure 5 shows the number of far advanced cases in each sex group, on a cumulative basis by age.

1. Throughout the 20 year period, the number of far advanced cases among males was considerably higher than that among females.

2. In contrast to the trend of minimal and of moderately advanced cases, there was no increase in the last few years in the number of far advanced cases. However, the decline in far advanced cases which began after 1936 was apparently retarded somewhat in the last 3 years, and this occurred in both sexes in the three age groups over 20.

*Age distribution of reported cases*—Figures 3, 4, and 5 show the trend of the number of cases in each age group, but they also indicate in general the relative number of cases in each age group. In order to present this characteristic of reported cases on an actual proportionate basis, Figure 6 depicts the percentage distribution by age of the cases in each sex group, in each of the three stages of disease. These data do not, of course, represent age-specific annual case incidence rates, since they are not related to the corresponding age composition of the population of the area concerned. They are nevertheless important because they show the

changes in age distribution of cases over a period of years and differences in age according to sex and stage of disease.

In general, respiratory tuberculosis is now primarily a disease of adults. This is shown by the downward slopes of most of the age curves in Figure 6, indicating that there has been a progressive increase in the percentage of cases in the older age groups, particularly in males. In part, this may be due to the progressive "aging" of the population.

In all three stages most of the cases in males occurred during the most productive industrial periods of life and in females during the childbearing period. Comparing the two sexes, there was a higher percentage of cases in males over 35 years of age than in females over 35, and this difference was progressively more marked as the stage of the disease became more advanced.

As for persons under 15 years of age, the relatively minor frequency of respiratory tuberculosis in this age group is clearly indicated in Figure 6.

#### DISCUSSION

From the standpoint of the trend of reported cases, the most important finding is that, following a period of 16 years of practically uninterrupted decline in the number of reported cases in males, a reversal of this trend occurred in the last 4 years of the 20 year span included in the study; among females, a similar though less marked change in trend occurred in the last 2 years of the period. In relation to the population of the area during the 20 year period, the annual *case rates* followed a pattern resembling that of the number of cases.

It is of interest to examine the possible reasons for the change in trend of reported cases. In the first place, it was not due to any change in statistical or clerical procedures in connection with case reporting. Second, it is unlikely

that the increase in cases among males in the last few years represents merely a chance fluctuation which might occur from year to year, because of the extent and duration of the change. As for the recent increase in cases among females, although the increase in number of cases in 1942 is not a statistically significant deviation, the character of the change leads to the belief that it is also not merely a chance fluctuation.

An important question which arises is whether the dislocations of life due to the war have resulted in an increased *rate of development* of new cases of tuberculosis. There is as yet no direct evidence bearing on this question, and further observations will be necessary in order that any effects of the war upon the incidence of tuberculosis may be fully evaluated. However, it is believed that the recent increase in reported cases has been primarily due rather to an increased *rate of discovery* of cases.

For one thing, the change in trend among males began in 1940, that is, prior to the time when any possible effect of wartime conditions upon the development of tuberculosis would have been expected to become manifest.

The best support for the belief that increased case finding was largely responsible for the increase in the number of cases reported is that the latter occurred during a period when there was a marked extension of case finding through mass chest x-ray examinations of apparently healthy groups of the population.

Furthermore, there is evidence that it was the routine chest x-ray examination of candidates for the armed forces at induction stations and otherwise which contributed greatly to the increase in the number of cases reported, for the greatest increase occurred among males, and the increase in this sex group was due largely to an increase in minimal cases in the age group 20-34,

which contains the vast majority of the men examined for the armed forces.

On the basis of available data it is estimated that over 500,000 residents of upstate New York had a chest x-ray examination as candidates for the armed forces during the period 1940 through 1943. A partial measure of the effect of these examinations upon the reporting of cases is available.

The reports of all newly reported cases among males in the age groups subject to military service have been checked routinely in the Division of Tuberculosis against a special index file of all men disqualified at induction stations because of tuberculosis. This serves to identify those reported cases who were initially diagnosed as having tuberculosis at the time of their induction station examination and who were *subsequently* reported for the first time as cases.\*

This procedure has revealed that about 40 per cent of the reported cases among males in the age groups subject to military service were initially diagnosed as having tuberculosis at the time of an induction station examination. Because of the incompleteness of some of the records pertaining to examinations by the armed forces, it is probable that these examinations actually led to the reporting of a higher proportion of cases than is indicated by the foregoing figure. In considering the wartime increase in reported cases in England and Wales, Stocks<sup>1</sup> estimated that about one-half of the increase resulted from the "exigencies of national service."

There is thus strong evidence that routine chest x-ray examinations by the armed forces contributed in large part to the increase in the number of reported cases in males. However,

other types of mass surveys also undoubtedly played a part, since age groups older than those represented in the armed forces examinations also shared in the increase in cases. For example, mass surveys of industrial workers have been conducted on a steadily increasing scale since 1942. In fact, it is likely that the increase in cases in females in 1942 and 1943 was partly, if not largely, due to such industrial surveys, since it is known that large numbers of women have been employed in various war industries and have thus become available for group examination. In this connection, it is significant that the increase in female cases in 1942 and 1943 occurred mostly in the minimal group in those over 35 years of age.

Because the vast majority of cases found in mass surveys are without symptoms, it is probable that most of the cases so discovered would not have been diagnosed until later years. As pointed out by Stocks and Lewis-Faning,<sup>2</sup> this aspect of the increase in reporting is related to the important matter of the occurrence of deaths from tuberculosis among persons not previously reported as cases. One would expect that an increase in reporting would be followed by a compensating decrease in the deaths of unreported cases. But in neither England and Wales nor in upstate New York has this occurred as yet. Rather, in both areas there has been a slight increase above the pre-war proportion of about 20 per cent of all tuberculosis deaths. Stocks and Lewis-Faning suggest that in England and Wales the reason may be that many immigrants have come there from countries where tuberculosis incidence is high, and also that excessive movement of the population has led to more people escaping "notification."

If it is accepted that mass surveys played an important part in the increase in the reporting of cases, the

\* This procedure is different from the routine of checking all induction station notices of tuberculous rejectees against a master file of reported cases to identify those who have been reported as cases prior to the induction station examination.

fact that the increases in both sex groups occurred largely in the minimal group provides further evidence of the tremendous value of this method of case finding. Indeed, between 50 and 60 per cent of the cases discovered in various types of mass surveys are in the minimal stage.

On the other hand, as far as the *proportionate* distribution of cases according to stage is concerned, an improvement in the percentage of minimal cases began *before* extensive mass surveys were started (Figure 2): in males in 1940 and in females in 1938. This would indicate that in case finding methods other than through mass surveys there has also been an improvement in early diagnosis. Mattison<sup>3</sup> has recently called attention to some of the factors which affect the early diagnosis of pulmonary cases.

Considering the data for the entire 20 year period, the actual relative increase in recent years in the proportion of minimal cases reported has undoubtedly been even greater than the figures indicate, because the degree of diagnostic accuracy in recent years, particularly as a result of the more extensive use of x-ray examination, is certainly higher than it was ten or fifteen years ago. Consequently, formerly there were probably many cases reported as minimal which on the basis of modern diagnostic procedures were actually moderately or far advanced; that is, the *true* proportion of minimal cases among those reported was formerly probably lower than that recorded. Conversely, it is unlikely that any appreciable number of cases reported in the earlier years as advanced were actually minimal in extent.

#### SUMMARY

1. From 1924 through 1939 in males, and from 1924 through 1941 in females, there was an almost steady decline in the annual number of cases of respiratory tuberculosis

reported in New York State, exclusive of New York City.

2. Among males a striking reversal in this trend began in 1940, reaching a peak in 1942, during which year the number of cases was 38 per cent higher than that in 1939.

3. Among females a less marked increase in reporting began in 1942, when the number of cases was 12 per cent higher than in 1941.

4. The increase in the total number of cases among males was due largely to an increase in minimal cases in the age group 20-34.

5. The increase in the total number of cases among females was due largely to an increase in minimal cases in the age groups over 35.

6. These changes in trend were not due to any changes in clerical or statistical procedures.

7. It is believed that the changes were probably due largely to the *discovery* of more cases rather than to the *development* of more cases, and that case finding through mass chest x-ray examinations contributed in large part to the reversal in trend, with the routine examination of candidates for the armed forces being a dominant factor among males.

8. During the period of the reversal in trend the increases in the number of cases occurred largely in the minimal group, but an upward trend in the *proportion* of minimal cases had already begun prior to the increase in the total number of cases, indicating an improvement in early diagnosis independent of the influence of mass surveys, but without doubt greatly impelled in the later years by mass methods of case finding. From a previous stationary level of about 20 per cent, the percentage of minimal cases in males increased to 38 per cent in 1943, and in females the corresponding change was from a level of about 25 per cent to 44 per cent in 1942. These changes were accompanied by a decrease in the percentage of far advanced cases.

9. Analysis of the age and sex characteristics of respiratory cases indicates that this form of tuberculosis is now primarily a disease of adults and that it occurs in both sexes during the period of greatest social and economic significance.

#### REFERENCES

1. Stocks, P. Mortality and Morbidity in Tuberculosis. *The Practitioner*, 153:1-10 (July), 1944.
2. Stocks, P., and Lewis-Fanning, E. Wartime Incidence of and Mortality from Respiratory Tuberculosis. *Brit. M. J.*, 1:581-583 (Apr. 29), 1944.
3. Mattison, B. F. Some Factors Affecting the Early Diagnosis of Pulmonary Tuberculosis. *A.J.P.H.*, 34:1163-1172 (Nov.), 1944.

# Prevalence of Rheumatic Heart Disease in Denver School Children

BERNICE G. WEDUM, M.D., ARNOLD G. WEDUM, PH.D.,  
M.D., AND A. L. BEAGHLER, M.D., F.A.P.H.A.

*Denver Area Rheumatic Fever Diagnostic Service; Department of Bacteriology, School of Medicine, University of Colorado; and Department of Health Service, Denver Public Schools*

RHEUMATIC heart disease is now the first cause of death, excepting accidents, among children aged 10 to 14 in Colorado and in the United States. Indeed, for the entire age group 5 to 19 during 1939-1942 in Colorado, rheumatic heart disease was first,\* while in the United States as a whole this position was occupied by tuberculosis.

Although the relative standing of states and cities changes slightly from time to time, during 1939-1942 Colorado led all other states in deaths from this disease among children aged 5 to 19 (Figure 1).

Denver had the second highest death rate from rheumatic heart disease at ages 5 to 14 among the 25 largest cities in the United States during 1939 and 1940.†

A report<sup>1</sup> on rheumatic fever in Army Air Force Camps in the United States has called attention to the surprising amount of this disease at stations in the western states. Hedley<sup>2</sup> had previously noted the high mortality from heart disease in these states. As far as military forces in the Denver area

are concerned, this was a temporary phenomenon. The camps which had so much rheumatic fever in 1943-1944, have practically none in 1944-1945. The reason for this is not entirely clear, but at least four factors must be considered: (1) seasoning of troops, (2) decrease in the rate of introduction of susceptible new recruits, (3) absence of a virulent epidemic streptococcus, and (4) sulfa prophylaxis.

Among children in Denver there has been no apparent decrease in the amount of rheumatic fever. During January, February, and March, 1944, there were in Denver hospitals 50 children under age 20 with rheumatic infections. During a similar period in 1945 there were 76 in the same hospitals, or a 52 per cent increase

TABLE 1

*Persons Under Age 20 with Rheumatic Heart Disease, Rheumatic Fever, and Chorea in Denver Hospitals During January, February, and March, 1944, Compared to 1945*

	1944	1945	Percentage Increase
Childrens' Hospital *	23	35	52
Colorado General *	15	22	47
Denver General †	12	19	58
Total	50	76	52

\* Admitted during these months

† Discharged during these months

In March, 1944, a survey conducted by the Colorado Coordinating Council for Crippled Children showed only one rheumatic patient under age 20 hospitalized elsewhere than in these 3 hospitals.

\* Calculated from U. S. Census 1940 and U. S. Vital Statistics 1939-1942, for *International List of Causes of Death* numbers 58, 90a, 92b, 92c, 93c, 95b.

† Calculated from Table 6. Deaths from Selected Causes, by Age, by Place of Residence, Each City of 100,000 Population or more in 1940. *Vital Statistics of the United States*. Supplement 1939-1940. Part III. U. S. Dept. of Commerce, Bureau of the Census.

FIGURE 1

# DEATHS FROM RHEUMATIC HEART DISEASE AMONG CHILDREN AGE 5 TO 19

RANK

1	COLORADO	13 3
2	UTAH	13 2
3	NEW YORK	12 3
4	DISTRICT OF COLUMBIA	12 0
5	NEW JERSEY	11.2
6	PENNSYLVANIA	10 4
7	DELAWARE	10 1
8	IDAHO	10.0
9	MARYLAND	8 9
10	NEW MEXICO	7 9
46	CALIF.	4.0
47	FLORIDA	3.9
48	ARKANSAS	3.7
49	MAINE	3 6

DEATHS PER 100,000 CHILDREN (1940 CENSUS) IN 1939-42

(Table 1). What part of this increase is attributable to the activities of the Denver Area Rheumatic Fever Diagnostic Service is unknown. This diagnostic service, financed by the Junior Community Chest and sponsored by the Denver Public Health Council, was opened in September, 1944.

## A SURVEY OF HEART DISEASE IN DENVER SCHOOL CHILDREN

Medical examination of school children is frequently used to determine the prevalence of heart disease. Summaries of such studies have been given by other authors.<sup>3, 4</sup>

One difficulty with surveys of heart disease in the schools is that the results depend so much upon the method employed. There are at least three possibilities: (1) all examinations are made by one or more phy-

sicians who are particularly trained in the cardiac examination of children, (2) all children are first examined by school physicians, and all possible cases of heart disease sent for final diagnosis to a central cardiac clinic or to a physician or physicians particularly interested in heart disease, and (3) all data are based on cardiac abnormalities as recorded in the course of routine physical examinations performed by many different school physicians without particular attention being paid to the heart.

The number of children found to have rheumatic heart disease will be much larger with method 1 than with method 2. Method 3 is apt to yield erratic results. This has been well discussed by Dublin,<sup>5</sup> Paul,<sup>6</sup> and Rutstein.<sup>7</sup> Paul<sup>8</sup> found in New Haven a rate of 38.5 per 1,000 by the first method and only 11.4 by the second.

The senior author has had the opportunity of participating in the use of method 1 and also method 2 in Denver during 1944 and 1945. The comparative results provide an interesting contrast.

Two methods were used:

1. All children were examined by one physician particularly interested in rheumatic heart disease (BGW). All but four of the positive diagnoses were confirmed by a second physician or by the Diagnostic Service. These four students were inaccessible for a confirmatory examination. In this fashion, 1,845 girls were seen in the Denver Junior and Senior High Schools. In some schools a majority of the girls in certain grades were examined. In others, there were only girls who had applied for swimming or gymnasium classes. There were about 300 of these. Their inclusion of course tends to decrease the overall percentage which was found to have heart disease because those with known cardiac defects are not apt to apply for gymnastic activities.

2. Other school physicians examined 1,318 boys and girls and screened out 143 with possible heart disease. Of these 143, 114 were then reexamined by one of us (BGW). For statistical purposes in computing the percentage of heart disease, the total number of children sampled was considered to be 114/143 of 1,318 or 1,051. The 29 who were not reexamined did not include a disproportionate number of cardiac abnormalities. They had been graduated, transferred, or were not available for miscellaneous reasons.

#### CRITERIA OF DIAGNOSIS

All children were examined supine with the chest bare. Most of them were also examined in the left lateral position, after exercise.

*Rheumatic Heart Disease*—A diagnosis of definite rheumatic heart dis-

ease was made only in the presence of one or more characteristic murmurs, with the exception of one case of adhesive pericarditis. A high pitched rather harsh systolic murmur at the apex transmitted toward the axilla, increased after exercise, heard best through the diaphragm of a Rieger-Bowles stethoscope, with the patient lying on the left side, was considered the murmur of mitral insufficiency. The diagnosis of possible early mitral stenosis was made in the presence of a low pitched mid-diastolic murmur accompanying mitral insufficiency. The presence of a low pitched rumbling diastolic murmur with presystolic accentuation was considered diagnostic of mitral stenosis. A blowing high pitched diastolic murmur heard best along the left sternal border was taken as aortic insufficiency. A harsh systolic murmur over the aortic area with a thrill over the carotid arteries accompanying a diminished aortic second sound in the presence of aortic insufficiency was considered possible aortic stenosis.

*Congenital Heart Disease*—This diagnosis was made when the findings were characteristic of a known type of congenital lesion. There was one case of patent ductus arteriosus, one of coarctation of the aorta, and one with an interventricular septal defect. Two cases with a very loud harsh systolic murmur at the base without a thrill were also included although the exact nature of the lesion could not be determined without further studies. There were no cyanotic cases.

*Possible Rheumatic Heart Disease*—In this class were put all children without characteristic murmurs in whom rheumatic heart disease was nevertheless suspected. Children with accentuated slapping first sounds, those with muffled distant first sounds, and those with markedly slurred first sounds were sometimes called "possibles," especially if there were a past history



of rheumatic fever. Those in whom cardiac hypertrophy seemed present clinically were placed in this category. Those with soft systolic murmurs over the pulmonic area or left sternal border were not included regardless of pitch. Medium or low pitched systolic murmurs at or just within the apex, were ordinarily not considered, regardless of the effect of exercise. However, some with a past history of rheumatic fever were classified as "possibles." Tachycardia by itself was not considered diagnostic although a few such children were classified as having possible active rheumatic carditis because of low grade fever. No significance was attached to third heart sounds. It has been noted that somewhat loud slurred third heart sounds in children can be confused with early mid-diastolic murmurs.

*Possible Congenital Heart Disease*—A few patients with rather harsh systolic murmurs over the base and one or two with loud high pitched late systolic murmurs were placed in this group.

#### RESULTS AND DISCUSSION

The types of heart disease found are summarized in Table 2. Table 3 shows that the amount of heart disease discovered in Denver varied with the method employed. Method 1 yielded 16.3 cases of definite rheumatic heart disease per 1,000 children examined and method 2 only 4.8.

TABLE 2

*Types of Rheumatic Heart Disease in 1,845 Denver High School Girls*

Types	Number
Mitral insufficiency	17
Aortic insufficiency	3
Mitral insufficiency and stenosis	2
Mitral and aortic insufficiency	1
Mitral stenosis	1
Mitral stenosis and aortic insufficiency	1
Mitral stenosis and insufficiency and aortic insufficiency	2
Old adhesive pericarditis	1
Type not recorded	2
Total	30

TABLE 3

*Prévalence of Heart Disease in Denver School Children, Showing That the Results Depend Upon the Method Employed*

	Method 1 All Examinations by B.G.W.	Method 2 Screened Cases Examined by B.G.W.
Number examined	1,845 girls	1,051 †
Rheumatic heart disease *	16.3	4.8
Possible rheumatic heart disease *	18.4	7.5
Congenital heart disease *	2.7	none
Possible congenital heart disease *	3.8	5.7

\* Rate per 1,000 children examined

† Boys and girls

This finding has caused us to re-examine various school surveys reported in the literature with a view to classifying them in regard to methodology. Several illustrative surveys are so classified in Table 4. The difference between the two types of survey is striking. Method 1 reveals much more heart disease. It is evident that we need to revise upward our estimates of the amount of rheumatic heart disease in school children. Instead of thinking in terms of 2 to 15 cases per 1,000 children, we need to think of 15 to 40. This rate is similar to that of 20 per 1,000 which existed in London in 1926 prior to the start of a "rheumatism scheme" which by 1938 was credited with being largely responsible for reduction of the rate to 8 per 1,000.<sup>9</sup> The exceptions to this rate of infection are likely to be only in the climatically favored sections of the country, illustrated in Table 4 by Redlands in southern California, and southern Arizona.

The authors feel that the rate of 16.3 per 1,000 school girls aged 12 to 19 in Denver is too low, for three reasons:

1. There was some artificial selection of children caused by the inclusion of about 300 girls applying for gymnasium and swimming permits. It is less likely that cardiac patients would make such application.

TABLE 4

*Prevalence of Heart Disease in School Children as Determined by Method 1, Direct Examination; and by Method 2, Preliminary Screening*

Survey	Reference	No. of Children Examined	Age	Sex	Rheumatic Heart Disease per 1,000		Congenital Heart Disease per 1,000	
					Method 1	Method 2	Method 1	Method 2
Denver	....	1,845	12-19	girls	16.3	...	2.7	...
Denver	....	1,051	12-19	boys and girls	....	4.8	...	0
Eureka, Calif	(3)	2,450	5-19	boys and girls	20.0	...	0.7	...
Redlands, Calif		2,635	5-19	boys and girls	3.8	...	0.8	...
Southern Ariz. Indians	(10)	1,019	5-19	boys and girls	5.0	...	...	...
Benson, Ariz.	(11)	690	?	boys and girls	10.0	...	...	...
New Haven & Hamden	(6)	1,836	mostly 12-14	boys and girls	25.0	...	...	...
Industrial cities—Conn.	(12)	918	12-14	boys and girls	41.0	...	...	...
Mont. & Wyo. Indians	(10)	688	5-19	boys and girls	45.0	...	...	...
Cincinnati	(13)	5,623	12-19	boys and girls	....	5.2	...	2.3
Philadelphia	(14)	33,293	6-18	boys and girls	....	5.0	...	0.9
Boston	(15)	119,337	5-19?	boys and girls	....	4.5	...	0.5
Louisville	(16)	41,905	6-15	boys and girls	....	3.6	...	1.6
San Francisco	(17)	13,338	6-18	boys and girls	....	2.2	...	1.4
Cincinnati	(18)	85,385	5-19	boys and girls	....	2.0	...	1.5

"Possible" rheumatic heart disease and "Possible" congenital heart disease omitted.

2. All "possible rheumatic heart disease" was not included. Had all these "possibles" been examined in the Denver Area Rheumatic Fever Diagnostic Service, some of them might have been relabeled as definite R. H. D.

3. When 527 girls were examined without selection in one of the high schools whose students came principally from a good residential district, the prevalence of rheumatic heart disease was 17.1 per 1,000. But among 285 girls in a high school located in an economically poor area, it was 31.6.

It has been stated "Where the death rates from rheumatic heart disease vary widely, it is not an unjustified assumption to consider that there is a corresponding variation in frequency or severity of rheumatic fever or of both frequency and severity."<sup>19</sup> It seems to us that the frequency in Denver is not unusual, but that the disease may be more severe.

Another interesting aspect derives from the fact that no diagnosis of rheumatic heart disease had been previously made in 17 of the 30 children

found by method 1. If the entire population aged 5 to 19 years were to have 16.3 cases of rheumatic heart disease per 1,000, and 17/30 of them be unrecognized, there must be some 639 undiagnosed cases in the city of Denver. It should be noted that this figure includes only cases of inactive rheumatic heart disease. Inclusion of those children with active rheumatic fever and those with a history of rheumatic fever would increase the total.

The above experience is similar to that of the Rheumatic Fever Diagnostic Service. In 6 months time, 91 children were seen with active rheumatic fever or inactive rheumatic heart disease. Among these 91, there were 42 previously unrecognized cases and an additional 11 who had either inadequate medical supervision or had ceased visits to a physician.

#### SUMMARY

1. The prevalence of rheumatic heart disease in Denver high school girls was found to be 16.3 cases per 1,000 children examined.

2. This prevalence is no more than would be expected in many large northern cities when all the cardiac examinations are made by a physician familiar with, and on the lookout for, signs of rheumatic fever and rheumatic heart disease.

3. Although the amount of rheumatic fever in Denver does not seem to be unusual, the death rate is disproportionately high.

4. Slightly more than half of the rheumatic children discovered in this school survey and in the Rheumatic Fever Diagnostic Service were new, previously unrecognized cases.

5. When a cardiac survey is conducted by reexamining only those children reported to have cardiac abnormalities as discovered by school physicians in the course of routine school physical examinations, which examinations are performed by many different physicians and without particular attention being paid to the heart, then the prevalence of rheumatic heart disease found is likely to be one-third or less of the true amount.

6. It is suggested that public health officials, in all except the climatically favored southern part of the United States, revise upward their conception of the amount of rheumatic heart disease in school children. Instead of considering that 2 to 15 school children per 1,000 have definite signs of rheumatic heart disease, we need to think in terms of 15 to 40.

#### REFERENCES

1. Holbrook, W. P. The Army Air Forces Rheumatic Fever Control Program. *J.A.M.A.*, 126:84, 1944.
2. Hedley, O. F. Trends, Geographical and Racial Distribution of Mortality from Heart Disease among Persons 5-24 Years of Age in the United States

During Recent Years (1922-1936). *Pub. Health Rep.*, 54:2271, 1939.

3. Sampson, J. J., Hahman, P. T., Halverson, W. L., and Shearer, M. C. Incidence of Heart Disease and Rheumatic Fever in School Children in Three Climatically Different California Communities. *Am. Heart J.*, 29:178, 1945.

4. Paul, J. R. *The Epidemiology of Rheumatic Fever and Some of Its Public Health Aspects*. Published for the American Heart Association by The Metropolitan Life Insurance Company, 1943.

5. Dublin, T. D. Methods of Determination of Incidence and Prevalence of Rheumatic Fever. Section A in reference 4.

6. Paul, J. R. *Rheumatic Fever in New Haven*. The Science Press Printing Company, Lancaster, Pa., 1941.

7. Rutstein, D. D. The Role of the Cardiac Clinic in the Rheumatic Program. *J.A.M.A.*, 126:484, 1944.

8. Paul, J. R. Methods of Determining the Prevalence of Rheumatic Fever in Cities and Small Communities. *Milbank Mem. Fund Quart.*, 13:52, 1935.

9. Bach, F., Hill, N. G., Preston, T. W., and Thornton, C. E. Juvenile Rheumatism in London. *Ann. Rheumat. Dis.*, 1:210, 1939.

10. Paul, J. R., and Dixon, G. L. Climate and Rheumatic Heart Disease. *J.A.M.A.*, 108:2096, 1937.

11. Shoun, A. N. Rheumatic Heart Disease in Arizona. *Southwestern Med.*, 27:140, 1943.

12. Paul, J. R., and Deutsch, J. V. *Rheumatic Fever in Connecticut. A General Survey*. Connecticut State Department of Health, Hartford, Conn., 1941.

13. Wiltzback, C. A. Physical Fitness Program. A Report of Medical and Dental Examinations of 5,620 Senior and Junior High School Students. *J.A.M.A.*, 125:828, 1944.

14. Cahan, J. M. Rheumatic Heart Disease in Philadelphia School Children. *Ann. Int. Med.*, 10:1752, 1937.

15. Robey, W. H. A Cardiac Survey of Children in Boston Public Schools. *Nation's Health*, 9:21, 1927.

16. Weiss, M. M. The Incidence of Rheumatic and Congenital Heart Disease among School Children of Louisville, Ky. *Am. Heart J.*, 22:112, 1911.

17. Sampson, J., Christie, A., and Geiger, J. C. Incidence and Type of Heart Disease in San Francisco School Children. *Am. Heart J.*, 15:661, 1938.

18. Rauh, L. W. The Incidence of Organic Heart Disease in School Children. *Am. Heart J.*, 18:705, 1939.

19. Swift, H. F. The Nature and Etiology of Rheumatic Fever. *Cincinnati M. J.*, 23:58, 1942.

**ACKNOWLEDGMENT:** The authors wish to thank the Denver Public School Nurses, the secretary to the medical director of Children's Hospital, and the personnel of the record room at the Denver General Hospital for their whole-hearted cooperation in this survey.

# A Public Health Rôle for the Laundry

M. E. BARNES, M.D., DR.P.H., F.A.P.H.A.

*Department of Hygiene and Preventive Medicine, State University of Iowa,  
Iowa City, Iowa*

IN 1938 the department of health of the State University of Iowa authorized a procedure whereby the isolation ward of the hospital forwards all washable articles to the University laundry without any preliminary disinfection whatsoever. This is true regardless of whether these articles have been contaminated by cases of typhoid, scarlet fever, smallpox, or any other disease which may happen to be cared for in the ward. By this action a general laundry was definitely incorporated into the routines of a department of health. The results during the ensuing years have been highly satisfactory, and the procedure is now on a permanent basis. The purpose of this paper is to call to the attention of health officers generally the feasibility of developing a similar type of service for their communities, especially serving households under quarantine for communicable diseases.

Among the cardinal principles of preventive medicine as applied to the control exercised over cases of diseases transmissible from person to person via bodily discharges is that of concurrent disinfection. Through this means an attempt is made to destroy infective material as completely as possible at its source, never permitting it to get beyond our control. As applied to washable articles from isolation hospitals and quarantined homes, this has been interpreted to mean that all contamination therein must be destroyed by appropriate measures, such as boiling or soaking in a disinfecting solution be-

fore they can be removed from the area. The basic principle is sound, but the interpretation is not necessarily so. In fact, when one observes the difficulties involved in carrying out this disinfection in homes unprepared for it and by individuals untrained for it, the need for finding a better way becomes imperative. When carried out by inexperienced persons, either boiling or the use of disinfecting solutions may fail to destroy pathogenic organisms. Woolens and colored garments cannot be boiled without damage due to shrinkage or color runs. Initial boiling will result in permanent stains from blood or albuminous materials which may be present. Even at best, the method is messy and difficult to control in a sanitary manner. In small apartments such quarantine restrictions are classifiable only as a calamity.

It so happens that the procedures employed by commercial laundries to render garments clean and attractive include some which are highly effective in removing and destroying vegetative microbic forms. By utilizing these measures it is quite feasible to include these laundries in the public health armamentarium by solving two general problems. These are:

1. Insuring that laundering procedures known to be effective in destroying microbic forms are followed.
2. Insuring the sanitary handling of the contaminated articles until they have been freed of their contamination.

The laundering processes which remove bacteria are the use of soap and

of detergents, which loosen soil from the fabrics, and the repeated changes of water (9 or more in the high temperature process) which carry away the soil and any bacteria therein.

The laundering processes which are capable of destroying microbic life include the following, as used in one or other of the standard procedures recommended by the American Institute of Laundering. Although aimed at other objectives, each of them can be controlled quite readily to contribute its maximum toward the destruction of pathogens, if this result is desired. Five such measures may be listed.

1. *Exposure to hot water*—In the high temperature process to which fabrics such as bed linen are subjected, the water temperatures increase to 160° F., and remain in excess of this level for more than 25 minutes. This exceeds the thermal death point for most pathogenic organisms.

2. *Chlorination*—White clothes, during the bleaching process, are exposed to chlorine in a concentration of 100 p.p.m., which is a lethal level for microorganisms.

3. *Sudden and extreme changes of pH*—The detergents used at the beginning result in a marked alkalinity, the pH readings being 10.0 or even more. Within approximately an hour, this is changed to the definitely acid reaction of pH 4.0 to 4.5 through the addition of acid fluorides in what is called the "souring" process. These changes are highly injurious to any vegetative organisms which may be exposed to them.

4. *Exposure to high air temperatures*—In the fluff-driers the fabrics are exposed to air currents with temperatures in excess of 160° F. for 20 or 30 minutes.

5. *Exposure to high moist or dry heat during ironing*—Articles intended to be ironed are damp so that the first exposure is to steam generated in the fabric by the heat of the iron. Inas-

much as at the point of contact the temperature of the iron approximates 330° F., the fabrics may be transiently exposed to high dry heat.

The sanitary effectiveness of these various measures has been exhaustively studied by Arnold.<sup>1</sup> Relative to the high temperature process he found that the initial flush water showed an average bacteria count of approximately 200,000 per ml. This count declined rapidly during the various suds treatments, falling to 5 in the last suds, when water at 165° F. was used. Following the "souring" process, the water from these garments was sterile. In the low temperature process used in washing colored articles, the water temperatures never exceed 100° F. The initial flush water had a bacterial count averaging roughly 3,600,000 per ml. By the last rinse this had fallen to 24,000, and in the souring stage it fell to 158. These and other details are given in two of his tables which follow.

Relative to the above procedures, it may be of interest to point out that the bleach used is sodium hypochlorite to yield a chlorine concentration of 100 p.p.m. Souring to pH 4.0 or 4.5 involves the use of fluoride sourers such as sodium acid fluoride, sodium silico-fluoride, ammonium acid-fluoride, ammonium silico-fluoride. In the washing of diapers, boric acid is used after the souring operation to prevent chafing and skin irritation.

Articles which pass through either of these standard treatments are subjected to hot-air fluff or rough drying, or to ironing. These serve as final factors of safety in so far as sanitation is concerned. These studies show that even as ordinarily carried out and without being specifically directed toward achieving the purpose, the standard processes employed by commercial laundries can, and for the most part do, result in freeing the articles from all

TABLE 1

*High Temperature Washing Formula (From Arnold<sup>1</sup>)*  
*White Clothes*  
*(One Year—120 Experiments)*

Operation	Purpose	Temperature Degrees Fahrenheit	Holding Time Minutes	Average Bacterial Count per ml. Wash Water
Flush	Wets cloth (removes surface soil)	110	5	200,428
1 Sud	Detergent (soap-alkali)	125	10	94,314
2 Sud	" " "	135	10	42,518
3 Sud	" " "	140	10	8,382
4 Sud	" " " Plus 1% Bleach	165-170	15	5
1 Rinse	Removes Detergent	165	3	1
2 Rinse	" "	165	3	0.5
3 Rinse	" "	165	3	0.4
4 Rinse	" "	165	3	0.2
After Sour	removes residual detergent	140	10	Sterile
Blue		110		

TABLE 2

*Low Temperature Washing Formula (From Arnold)*  
*Light Colored Clothes*  
*Light-Colored Clothes—Finished Service*  
*Dark-Colored Clothes*  
*(One Year—120 Experiments)*

Operation	Purpose	Temperature Degrees Fahrenheit	Holding Time Minutes	Average Bacterial Count per ml. Wash Water
Flush	Wets cloth (removes surface soil)	90-100	5	3,674,055
1 Sud	Detergent (soap-alkali)	100	10	1,979,862
2 Sud	" " "	100	10	1,248,758
3 Sud	" " "	100	10	255,579
4 Sud	" " "	100	10	221,293
1 Rinse	Removes Detergent	100	3	88,966
2 Rinse	" "	100	3	67,416
3 Rinse	" "	100	3	43,809
4 Rinse	" "	100	3	35,278
5 Rinse	" "	100	3	24,441
After Sour	removes residual detergent, brightens colors	95	5	158

traces of their original contamination. This being the case, it is quite possible to work out controls which will insure certainty in attaining this result. Such controls over water temperatures, time, chlorine concentrations, changes in pH, and others, must be adjusted to the conditions under which any given plant operates. The degree of hardness of the water or the facilities for maintaining satisfactory water temperatures will affect the laundering processes which are required. Therefore, controls should be directed toward those specifically needed under the laundering procedures which are feasible in that particular plant.

In devising a safe method for handling the contaminated linen from the bedside to the interior of the laundry washer the following additional requirements have been met:

1. Instruction of the personnel who handle the contaminated articles.
2. Immunization of the personnel. Although under the procedures the nurse in the patient's room is the last person who is in contact with the linen, it is advisable to provide against possible breaks in technique either at the hospital or at the laundry. For this reason the laundry workers involved (in fact, all laundry workers) are given pre-employment health examinations, including tuberculin tests and chest x-ray plates, Schick and Dick tests. All susceptibles are im-

munized against smallpox, typhoid fever, diphtheria and scarlet fever.

3. Arrangements for sorting at the isolation area, thus by-passing the sorting room at the laundry.

4. Arrangements for counting and marking to be carried out after the articles have been laundered, thus eliminating any exposure in these operations.

5. Collection of the articles in mesh bags or other suitable containers wherein they are laundered without removal therefrom.

6. Conveyance of these bags of contaminated articles to the laundry without contaminating objects or persons. This is done by using large baskets provided with canvas linings and covers within which the mesh bags are packed.

7. Method of loading the mesh bags into the laundry washer without contaminating any person or object. By using tongs, the mesh bags and finally the canvas protectors are removed into the washers.

Through these procedures the contaminated articles are moved, without danger to anyone, from the isolation area to the interior of the laundry washer. From that point the various controlled laundering procedures summarized above insure the complete destruction of any dangerous microbic forms therein. This detailed plan has been described by Heeren, Bradley, and Taylor<sup>2</sup> who participated in working it out. The results have been checked by bacteriological studies and the arrangement officially authorized by the University Department of Health.

Impressed with the satisfactory results of the arrangements just discussed, an additional use of the laundry was worked out whereby gauze reclamation was effected. This was begun in 1941 as a measure of war economy. Through this means the hospital saves some \$200 per month in the purchase of gauze, thus releasing an equivalent amount for war needs. The used sponges are collected in mesh bags and deposited in specially marked heavy canvas containers. These are transferred to the laundry and placed in a

washer in a manner similar to that which has been described. The mesh bags and their contents are laundered by a special procedure which includes high water temperatures and fluff-drying. The pieces of dried gauze are straightened out by hand, stretched upon special frames<sup>3</sup> in layers, and assembled into small bundles for return to the hospital. There they are folded to form sponges which, after proper autoclaving, are ready to be used again. The adequacy of these procedures has been shown by careful bacteriologic studies. It would be difficult to imagine material more heavily and more dangerously contaminated than is represented by the isolation linen and the blood-and-pus-saturated sponges which are handled routinely by the University laundry.

In all other respects this establishment operates as a public laundry. It handles approximately 100,000 pounds per week of articles of all sorts. It receives personal laundry from the internes, nurses, Army and Navy units on the campus. Bed linens and towels come from the hospitals and University dormitories. Table linen comes from the hospital and University dining services. Even diaper service is available to the obstetrics, pediatrics, and orthopedics departments, the total daily volume being approximately 200 pounds. The arrangements relative to isolation linen are permanent. Economic factors must determine whether gauze reclamation will continue after the war.

That it is possible to use the general laundry as a definite part of the public health armamentarium has been amply demonstrated by the more than seven years' experience in the operation of such a plan. Throughout this entire period, there has not occurred a single case of illness attributable to the contaminated material handled. If the laundry can be so utilized here, a

similar arrangement should be possible in any community where a public laundry exists and where the industry is willing to cooperate with the department of health. The procedures followed here can be adapted to individual homes. This would centralize the contaminated articles and permit the health officer to insure their sterility—something which he cannot be sure of doing under present conditions. That such arrangements would prove a great boon to quarantined households is obvious to anyone who has had such sickness in his own home.

#### SUMMARY

1. A board of health for seven years has included a general laundry in its armamentarium under established controls.
2. Under the procedures authorized, this laundry accepts contaminated linen from the isolation wards without prior disinfection, regardless of the nature of the contamination.
3. Under the procedures, this laundry accepts and reclaims used hospital sponges.

#### REFERENCES

1. Arnold, Lloyd. A Sanitary Study of Commercial Laundry Practices. *A.J.P.H.*, 28:839-844 (July), 1938.
2. Heeren, R. H., M.D., Bradley, L. A., and Taylor, Eloise, R.N. Handling Contaminated Linen in the General Laundry. *Mod. Hosp.*, Dec., 1941.
3. How the University of Iowa Reclaims Soiled Surgical Sponges. *The Laundryman*, Sept., 1942.

---

## Saving Permanent Teeth in School Children

The June, 1945, *News Letter* of Kansas State Board of Health tells of the dental health record achieved in school children of Baldwin City (population, 1,239). After 5 years' operation of the dental program recommended by Dr. Leon R. Kramer, Director of the Dental Hygiene Division of the State Health Department, not one permanent

tooth was extracted among Baldwin City's 184 grade school children and only 16 among the 109 high school children. This result was accomplished by the cooperation of the town's one dentist, the public health nurse, the teachers and local organizations, and shows what teamwork can accomplish even in rural districts.



# Distribution of *Shigella* in India as Determined by Spot Agglutination with Absorbed Sera\*

JOHN B. NELSON, PH.D., CARL TENBROECK, M.D.

*Department of Animal and Plant Pathology of The Rockefeller Institute  
for Medical Research, Princeton, N. J.*

AND

GUSTAVE J. DAMMIN, MAJOR, MC

*Laboratories Division, Preventive Medicine Service, Office of The Surgeon  
General, Washington, D. C.*

THE observations on bacillary dysentery herewith reported were made in India during the summer and fall of 1944 by the Subcommittee on Dysentery, Commission on Tropical Diseases of the Army Epidemiological Board.

Laboratories adequately equipped for bacteriological diagnosis were set up in Army hospitals located at Calcutta and along the Ledo Road in Assam. The former station was representative of a densely populated urban area and serviced American troops, many of whom were quartered in semi-permanent camps but were in close contact with a large Indian population. The latter station was representative of a sparsely populated rural area and serviced both American and Chinese troops, many of whom had been subjected to the primitive conditions of jungle fighting for considerable periods of time. With the exception of men living in fixed camps in this area, con-

tact with Indians was much less than in the Calcutta area.

Data on the comparative incidence of *Shigella* in these two localities were collected from three sources, namely, patients admitted to the hospitals with diarrhea, dispensary admissions with the same complaint, and groups of soldiers on duty, some of whom had been exposed to preëxisting dysentery or undiagnosed diarrhea. The laboratory observations were mainly limited to cultures from American troops but also included a scattering of cultures from Chinese troops, Indian helpers, and Japanese prisoners of war.

In addition to furnishing data on bacillary dysentery, the present survey also served as a test of the technical procedures carried out under field conditions. In spite of a difficult environment, it is felt that accuracy within the limits of the methods employed was maintained throughout the survey.

The procedure employed by the Subcommittee for the collection of material was essentially the well tried method of Hardy.<sup>1</sup> Cultures were made at the bedside or at the campsite by insertion into the rectum of a swab.

---

\* This investigation was supported in part by the Commission on Tropical Diseases, Board for the Investigation and Control of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of The Surgeon General, U. S. Army.

enclosed in a short length of lubricated rubber tubing, the entire assembly having been sterilized in the autoclave. On withdrawal from the rectum the swab was immediately rubbed over the surface of a freshly prepared Petri dish of Shigella-Salmonella medium (Difco). Para-aminobenzoic acid in a concentration of 2 mg. per cent was added to the SS medium prior to the pouring of plates. In carrier studies which involved the culturing of several hundred men, the work was done by a team of three.

The inoculated plates were incubated at 37° C. for approximately 24 hours, and examined. Those which showed colorless or white colonies were saved, and up to five transfers from each plate made to double or triple sugar agar. After 18 hours or so of incubation those which showed a characteristic alkaline slant and gas-free acid butt were held for direct agglutination. If possible two slants were examined serologically. The surface growth was suspended in 0.25 ml. of saline solution and a 5 mm. loopful mixed with 0.05 ml. of diluted serum in a depression plate.<sup>2</sup> The outside temperature was sufficiently high so that agglutination if it occurred was generally prompt. If there was no agglutination within a minute, the slide was incubated at 37° C. for 5 minutes.

The diagnostic sera used by the Subcommittee were prepared at The Rockefeller Institute in Princeton, N. J., and were essentially specific. High titered group agglutinin particularly characteristic of the *Shigella paradysenteriae* group was removed or reduced to a low content by absorption. These sera were shipped in a dried state. Sera against the other species of *Shigella* were mostly used unabsorbed as their group agglutinin titer was low. These were shipped in a fluid state diluted half with glycerin. Prior to use the sera were diluted 1:25 or 1:50 with

saline solution containing 0.25 per cent phenol. The diluted sera were stored in a refrigerator and maintained their titer very well for at least two months.

Cultures which were presumptively positive on SS agar and in triple sugar were tested first with two polyvalent *S. paradysenteriae* antisera containing Flexner and Boyd types, respectively. If positive they were identified as to species with monovalent absorbed sera. If negative they were successively tested with *Shiga*, *sonnei*, *ambigua*, *alkalescens*, and *dispar* sera. In case the suspension from the first triple sugar culture failed to agglutinate with any serum, the second culture was examined. In testing with *S. alkalescens* serum the suspension was first immersed in boiling water for 5 to 10 minutes.

The results of the survey in respect to the frequency rates of *Shigella* are presented in Table 1. Fifteen of the 17 commonly accepted species were isolated at one or both stations, the two exceptions being Boyd D 19 and Boyd 170 of the paradysentery group. The *S. ambigua* rates were approximately the same in both Calcutta and Assam; otherwise there was a marked lack of uniformity in distribution. The most striking difference occurred with *S. sonnei*, 22 strains being isolated in Calcutta but only one in Assam. The high rate in Calcutta was not referable to any one outbreak. The increased incidence of Boyd 103 in Assam was attributable, however, to a minor local epidemic. The large number of V and W strains of *S. paradysenteriae* isolated in Assam were chiefly encountered in healthy carriers from several different organizations. The total combined V, W, and Z rates were in close agreement with those earlier reported by Boyd in his much more extensive Indian survey of 1932-1935.<sup>3</sup> His figure based on 7,339 *Shigella* isolations was 50.2 per cent, whereas that obtained by the Subcommittee was

TABLE 1

*The Analysis of Shigella Cultures Isolated in India*

Species	Calcutta		Assam		Combined	
	No.	Per cent	No.	Per cent	No.	Per cent
<i>Shigella dysenteriae</i>	2	1.5	12	5.1	14	3.8
<i>Shigella paradysenteriae</i> :						
Flexner V	11	8.5	77	33.0	88	24.2
Flexner W	23	17.8	51	21.8	74	20.4
Flexner Z	6	4.6	6	2.5	12	3.3
Newcastle-Boyd 88	28	21.5	6	2.5	34	9.3
Boyd P 119	1	0.7	0	0.0	1	0.2
Boyd 170	0	0.0	0	0.0	0	0.0
Boyd 103	7	5.4	28	12.0	35	9.6
Boyd P 288	1	0.7	1	0.4	2	0.5
Boyd D 1	4	3.1	1	0.4	5	1.3
Boyd P 143	0	0.0	3	1.2	3	0.8
Boyd P 274	1	0.7	4	1.7	5	1.3
Boyd D 19	0	0.0	0	0.0	0	0.0
<i>Shigella ambigua</i>	21	16.2	37	15.8	58	16.0
<i>Shigella sonnei</i>	22	17.0	1	0.4	23	6.3
<i>Shigella dispar</i>	2	1.5	2	0.8	4	1.1
<i>Shigella alkalescens</i>	1	0.7	4	1.7	5	1.3
Total	130		233		363	

47.9 per cent. Aside from these rates and the comparative rarity of the minor Boyd species there was little correlation between the two sets of data.

Since nearly 70 per cent of all *Shigella* isolations were in the paradysentery group, the use of absorbed sera in conjunction with spot agglutination resulted in a significant saving of labor and materials. The use of absorbed sera also resulted in more accurate diagnosis, eliminating the guess which formerly had to be made with cultures agglutinating to nearly the same end point in each of several unabsorbed sera. With this technic final identification could generally be made 48 hours after culturing and, in some instances, if the SS plate growth was sufficiently pure, in 24 hours. It is our opinion that absorbed serum used in conjunction with spot agglutination, a method which has only recently come into general use for the identification of *Shigella*, is far superior to the former method employing unabsorbed serum and a series of dilutions in tubes. It should be noted that agglutinin absorption was employed much earlier by

Boyd<sup>3</sup> and by Andrewes and Inman<sup>4</sup> for the separation of *Shigella*. The only anomalous finding encountered during the course of the survey concerned *S. ambigua* and apparently was referable to some antigenic deficiency in the culture originally used for preparing the antiserum.

Approximately 80 per cent of the 450 cultures which gave a presumptively positive biochemical reaction were subsequently identified as *Shigella*. The remaining 20 per cent of the cultures, which failed to agglutinate in any of the *Shigella* antisera, comprised two general groups, one of motile, the other of nonmotile bacteria.

Motility was determined by stab inoculation of semisolid agar containing 0.4 per cent agar and 10 per cent gelatin. In this medium a motile organism produces a diffuse growth while a nonmotile one grows only along the line of inoculation. In some instances, particularly in carrier studies, the inoculation of semisolid agar from the triple sugar culture was included as an additional step prior to agglutination. All motile bacteria were also tested with

an *Eberthelle typhosa* antiserum and all failed to agglutinate. Their behavior on SS agar and in triple sugar agar indicated that lactose was not fermented, but on further testing in Durham tubes containing lactose alone practically all of them produced acid in 24 to 48 hours.

The nonmotile cultures which failed to agglutinate in any of the *Shigella* antisera when first tested were transferred several times and then inoculated into Durham tubes containing dextrose, mannite, lactose, and saccharose, respectively. They were finally reagglutinated with antisera which corresponded with the sugar pattern. Several strains of *sonnei* were thus identified, but most of the cultures again failed to agglutinate. These cultures were sent to The Rockefeller Institute in Princeton where they were retested biochemically with a greater range of carbohydrates; indol production was determined; and their reaction on Simmons's citrate agar observed. There was a wide variation in the sugar pattern and in indol production. Most of them failed to grow on citrate agar. The serological findings determined by tube agglutination were again uniformly negative.

The motile bacteria, which constituted 6 per cent of all presumptively positive cultures, were not encountered more frequently in India than they were during earlier surveys of Army camps in the United States. Since there is no indication at present that any members of the genus *Shigella* are motile, despite one of the earlier descriptions of *S. paradysenteriae* New-castle,<sup>5</sup> and since *Shigella* antigens were not demonstrable in any of the motile bacteria, they were regularly reported as "*Shigella* negative." There is no evidence as to the etiological relationship of these bacteria to diarrhea other than their recovery from the intestinal tract of patients. They were, however,

as frequently isolated from the intestines of normal individuals who gave no history of diarrhea.

The nonmotile bacteria, comprising 14 per cent of all the presumptively positive cultures, were encountered much more frequently in India than during our earlier work in the United States. They were troublesome in the reporting of laboratory findings, particularly when recovered from patients with diarrhea in the absence of known infective agents. It is by the chance recovery of such exceptions that new species are found. Since none of the nonmotile bacteria contained antigens in common with any of the known species of *Shigella*, they were withheld from that genus and reported as "*Shigella* negative." The more detailed examination of these bacteria at The Rockefeller Institute in Princeton yielded no evidence that would alter this opinion. As in the case of the motile bacteria, the nonmotile ones were recovered as often from the intestinal tract of normal individuals as from patients with diarrhea.

#### SUMMARY

An analysis of 450 presumptively positive intestinal cultures isolated in Calcutta and Assam is presented and discussed.

Eighty per cent of these cultures were identified serologically as *Shigella*, 14 per cent were unidentified but contained no related antigens, and 6 per cent were motile. *S. paradysenteriae* comprised 70 per cent of the specific group which included in all 15 different species.

The efficacy of spot agglutination in conjunction with absorbed antisera for the identification of *Shigella* is emphasized.

NOTE: The writers gratefully acknowledge the technical assistance of Miss Marion Orcutt, of The Rockefeller Institute in Princeton, and the helpful coöperation of the

many officers and enlisted men from the Medical Department of the Army who participated in the survey.

## REFERENCES

1. Hardy, A. V., Watt, J., and DeCapito, T. *Pub Health Rep.*, 57:521, 1942.

2. The depression plate made by the Clay-Adams Company was used throughout for spot agglutination.
3. Boyd, J. S. K. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 33:553, 1940.
4. Andrewes, F. W., and Inman, A. C. *Great Britain Med. Research Com. Nat. Health Insurance, Special Rep. Series, No. 42*, 1919.
5. Downie, A. W., Wade, E., and Young, J. A. *J. Hyg.*, 33:196, 1933.

## United States Committee for Study of Joint Causes of Death

The State Department of the United States Government has created a subcommittee for the study of joint causes of death. This is a subcommittee of the Joint Committee appointed by the International Statistical Institute and the Health Organization of the League of Nations as recommended by the 1938 Conference for the Revision of the *International List of Causes of Death*.

Lowell J. Reed, Ph.D., Professor of Biostatistics and Dean of the School of Hygiene and Public Health of The Johns Hopkins University, has been designated as chairman of the subcommittee with Halbert L. Dunn, M.D., Bureau of the Census, and Selwyn D. Collins, Ph.D., United States Public Health Service, as co-secretaries.

Members appointed to the committee are:

- George Bachr, M.D., Mount Sinai Hospital, New York, N. Y.  
Y. Biraud, M.D., League of Nations, Geneva, Switzerland (acceptance to the committee not yet received)  
F. S. Burke, M.D., Chief of the Foreign Relations Section, Department of Veterans' Affairs, Ottawa, Ontario, Can.  
Edwin L. Crosby, M.D., Assistant Director, The Johns Hopkins Hospital, Baltimore, Md.  
W. Thurber Fales, D Sc., Director Statistical

Section, City Health Department, Baltimore, Md.

J. T. Marshall, Chief, Vital Statistics Branch, Dominion Bureau of Statistics, Ottawa, Ontario, Can.

Brigadier J. C. Meakins, Department of National Defense (Army), Ottawa, Ontario, Can.

Edward S. Rogers, M.D., Assistant Commissioner for Medical Administration, State Department of Health, Albany, N. Y.

J. Wyllie, M.D., Professor of Preventive Medicine, Queen's University, Kingston, Ontario, Can.

Consultant to Committee: Percy Stocks, M.D., Registrar General Office, Statistical Branch, Lancashire, England

The last conference for the Revision of the *International List of Causes of Death*, held at Paris in 1938, requested the United States Government to appoint this subcommittee with the objective of obtaining unity in the methods involved with the selection of the main cause of death when two or more causes are mentioned on the death certificate. The subcommittee will also study the various national lists of diseases now in use in this country. This type of study by each nation was recommended by the Conference in order to bring the national disease codes into line with the detailed *International List of Causes of Death*.

# Background of Current Trends in the Relation of Public Health to Medical Care

MILTON TERRIS, M.D., M.P.H.

*Assistant District Health Officer, New York State Department of Health,  
Buffalo, N. Y.*

ON October 4, 1944, the Governing Council of the American Public Health Association adopted a comprehensive report urging the development of a national program of medical care in which public health agencies would assume major administrative responsibilities.

This action, which marks a striking departure from the traditional isolation of the public health profession from therapeutic medicine, represents no accidental decision but a logical development in the evolution of preventive medicine. The report adopted by the American Public Health Association is consistent with the thinking of a previous generation of public health workers whose approach to the problem of medical care is well worth studying today.

It is a significant and often overlooked fact that federal public health services in this country had their origin in a government system of health insurance and medical care. The U. S. Public Health Service grew out of the Marine Hospital Service established by Congress in 1798 to care for sick and injured merchant seamen. It was only in the last quarter of the 19th century that the Marine Hospital Service began to assume duties in relation to quarantine and other traditional health services. For this reason the U. S. Public

Health Service has never been a purely preventive agency, but has afforded its medical officers training in curative medicine and hospital administration.

The situation in regard to the state and local health departments has been quite different. Their activities have until recent years been strictly limited to preventive functions.

The practising physician, on the other hand, is still insufficiently involved in the prevention of disease. The isolation of preventive from therapeutic medicine has operated to the detriment of both.

But the development of preventive medical science has of its own momentum tended increasingly to eliminate the barriers between prevention and cure. The very triumphs of the purely preventive techniques, such as sanitary measures and preventive inoculations, have made them relatively less important, though still necessary; for with the conquest of many of the acute communicable diseases there has necessarily occurred a shift of emphasis to the chronic illnesses which are the major causes of disability and death. In tuberculosis, health officers realized that good hospital care was essential to prevention of the spread of the disease, and so they crossed the line into medical care by establishing and operating tuberculosis hospitals. In syphilis, public

health officials again found it necessary to treat in order to prevent. In cancer, health departments have begun to provide diagnostic and treatment facilities in order to combat the disease early in its course and thereby prevent serious consequences.

As a result, the artificial wall which had been built up between preventive medicine and medical care has been partially leveled. The report on medical care adopted by the American Public Health Association is a sign that perhaps an early completion of the leveling process may be anticipated.

This emphasis on breaking down the barriers between preventive and curative medicine does not mean that there is no distinction between them. The objection of forward-looking health officers is not to the distinction between the two but to their separation.

For example, the American Public Health Association report on medical care urges that public health agencies be given major responsibilities for administration "because of administrative experience and accustomed responsibility for a public trust." These are good reasons, but overlook a very cogent one based on the distinction between preventive and curative medicine. The private practitioner is by training and experience oriented to the diagnosis and treatment of illness. The administrator of hospital insurance plans has an actuarial and financial approach to medical care. The public health official on the other hand is by training and experience oriented to the prevention of disease, and can therefore make a specific and important contribution to the administration of a medical care program. There is no group more capable of infusing the philosophy and techniques of preventive medicine into every aspect of a medical care system than the public health profession.

The responsibility of administering

a medical care program would open up to the public health official the entire field of medicine for the application of the preventive approach. For instance, he would be in a position to obtain the adoption on a wide scale of routine chest x-rays of patients in general hospitals. He could urge the use of clinic waiting rooms in general hospitals for purposes of health education, adopting techniques which have already been brilliantly developed by Henriette Strauss at the Johns Hopkins Hospital.<sup>1</sup> He would encourage the utilization of preventive methods in diseases which heretofore have been considered entirely outside the realm of prevention. Alvarez's recent suggestion of a simple and practical method of preventing peptic ulcer recurrences is a case in point.<sup>2</sup> Another is the adoption of foot care clinics for diabetics, such as some of our leading hospitals are now using to prevent diabetic gangrene. In every branch of medicine, the health officer, as administrator of medical care services, would be in a strategic position to emphasize prevention and thereby help develop a new type of medical practitioner, oriented more fully to the prevention of disease.

This approach to the problem of the relationship of public health and medical care has significant historical precedent. Before 1871 the Marine Hospital Service operated as a medical care system pure and simple, administered by the customs collectors in the various ports and the clerks of the Revenue Marine Division of the Treasury Department. Reorganization by Congress brought the Service under the central supervision of Dr. John M. Woodworth, its first Supervising Surgeon, who was thoroughly imbued with the new preventive spirit which was to find material expression in the organization of the American Public Health Association in 1872. Dr. Woodworth not only improved the efficiency of the

Service but instituted the first effective application of the preventive philosophy to a medical care system.

In 1874, at a time when government health insurance was, in Dr. Woodworth's phrase, "still a peculiarly American institution," he stated in his Annual Report:

While the primary object of the Service as defined by statute is the "relief of sick and disabled seamen," the duty of preventing, in whatever degree, such sickness and disability, is also conceived to be within its scope. Hence, preventive medicine, which is receiving from the profession a continually increasing amount of attention, has not been lost sight of in its bearing upon the physical welfare of seamen; and the medical officers of the Service have been invited to study and report upon the conditions of seafaring life with a view to devising measures for the preservation of the sailor's health and his protection from disease.<sup>3</sup>

The Annual Report for 1874 contained articles on The Hygiene of the Forecastle; Unseaworthy Sailors; Diseases of River-men, Their Causes and Prevention; Preventable Disease on the Great Lakes; Syphilis, the Scourge of the Sailor and the Public Health; Yellow Fever at Pensacola in 1874, etc.

The Marine Hospital Service took the initiative in providing free physical examinations of merchant seamen, and recommended legislation which would require examination before shipping. It focused attention on the high death rate from respiratory disease and called for elimination of unhygienic conditions on ships:

Over fifteen per cent of the total deaths in marine-hospitals was due to pulmonary phthisis; and when to this is added the mortality from bronchitis, pneumonia, and other diseases of the respiratory organs—over ten and one-half per cent—the importance of such special study of the conditions of sea-life in their bearing upon these diseases, as is suggested by Surgeon Heber Smith's Hygiene of the Forecastle, and other of the subjoined papers, is apparent. Rosewood fittings, Axminster carpets, and silver plate in the captain's cabin; and darkness, foul air, and moisture in the fore-castle, are incongruities

which jar on the senses of even the laic observer; but these conditions in the fore-castle are crimes against hygiene which pay heavy penalties in increased sickness and consequent expense, and in short-handed and short-lived crews.<sup>3</sup>

Acting on the principle that "the application of preventive measures should not be confined to the seamen on shore, but should extend to the sailor afloat," the Marine Hospital Service urged more adequate legislative requirements for antiscorbutic provisions. It recommended the passage of laws requiring vessels to maintain certain standard medicines and surgical dressings in their medicine chests, and prepared and distributed a *Handbook of Ship-Medicine and Surgery* for the use of merchant vessels.<sup>4</sup>

This early demonstration of an effective integration of preventive and therapeutic medicine was soon forgotten. In the ensuing years public health agencies devoted themselves with unbounded energy and enthusiasm to the application of the epoch-making discoveries of Pasteur and Koch. For several decades signal successes were scored in the war on communicable disease without entrance into the field of medical care. Only in the recent period have the intrinsic factors in the development of preventive medicine driven public health in this direction.

Likewise, the powerful external forces which were developing throughout the bacteriological period in public health, and which were destined eventually to exert a decisive influence on the relation of public health to medical care, did not reach maturity until recent years. These social factors were the emergence of industrial society with concomitant insecurity of large sections of the population, and a remarkable technical development of medical science. The inevitable result has been a public clamor for social insurance to finance medical care as well as an increased



emphasis on hospital and group practice.

In 1916, the first proposals for government health insurance were introduced into several state legislatures. The bills were sponsored by the American Association for Labor Legislation, which had just completed a successful nation-wide campaign for workmen's compensation laws. The attitude of the public health profession to the proposed legislation was expressed in a report adopted May 13, 1916, by the Fourteenth Annual Conference of State and Territorial Health Officers. That report bears much the same relation to the health insurance bills of 1916 that the report on medical care adopted by the American Public Health Association in October, 1944, bears to current proposals. Both reports took a positive approach to medical care, while indicating deficiencies in the proposed legislation and suggesting improvements. Both reports emphasized the need for administration by public health agencies, but while the 1944 report was content to cite "administrative experience and accustomed responsibility for a public trust" in support of its position, the 1916 report went a step further. It criticized the proposed legislation because "the matter of providing medical benefits has been left in the hands of the local bodies, and no provision has been made for correlating the system with existing health agencies. These are serious objections, since without such provisions a health insurance law will have little value as a preventive measure, although it may meet with the approval of those who advocate it as a relief measure."<sup>5</sup>

The 1916 Conference of State and Territorial Health Officers understood fully the need for administration of the medical care program by public health agencies in view of the importance of the preventive approach to medical care. Their report continues:

Health officials should realize now, the necessity for correlating the administration of the medical benefits of any proposed health insurance system with existing health agencies. If health departments are at present inefficient, they should be strengthened and made adequate to meet all demands.

To enact a health insurance measure simply as a relief measure without adequate preventive features would be a serious mistake, but with a comprehensive plan for disease prevention there is every reason to believe that it would prove to be a measure of extraordinary value in improving the health and efficiency of the wage-earning population.<sup>5</sup>

Of course, the 1916 report lags in many respects behind the report adopted by the American Public Health Association. We have today the advantage of the experience of 'twenty-eight years in which great changes have taken place. Yet one is struck by numerous similarities. The 1916 report called for financing the medical care program through combined social insurance and taxation, and the 1944 report favors social insurance supplemented by general taxation or general taxation alone. Both reports recommend that the principle of free choice of physicians be preserved. It is of interest that the 1916 report also suggests that

In addition, free choice should be allowed to those who prefer institutional treatment by a selected staff when available, and to this end the local and federated governing bodies might even provide dispensary and hospital units, each such unit to include a staff of physicians, surgeons, oculists, dentists, and other specialists, and a staff of visiting and bedside nurses.<sup>5</sup>

In the 1944 report, a great deal of emphasis is placed on the provision of needed hospital and health center facilities, as well as "the desirability of combining hospital facilities with the housing of physicians' offices, clinics, and health departments."<sup>6</sup>

The 1916 report recommends that physicians be paid on a capitation basis so as to "offer every incentive to them to keep their patients well," while the

1944 report recommends that the private practitioners in each area be allowed to choose payment by fee-for-service, capitation or salary, but calls attention to the fact that fee-for-service alone is not well adapted to a system of wide coverage.

The 1916 report of the Conference of State and Territorial Health Officers was based largely on an investigation made by Surgeon B. S. Warren and Statistician Edgar Sydenstricker published as *Public Health Bulletin No. 76*, "Health Insurance: Its Relation to the Public Health." This *Bulletin* is a significant document in the development of medical care in the United States, both because of its excellent factual material and its insistence that the administration of a medical care program "must be closely coordinated with public health agencies if it is to attain the greatest degree of success as a preventive measure."<sup>7</sup>

Warren and Sydenstricker also pointed out the intrinsic preventive character of a medical care system which would remove the economic barrier to early diagnosis and treatment, since "the wage earner would seek the

advice of his family physician earlier and oftener in case of all ailments and thus aid the physician in preventing serious diseases."

In 1919, B. S. Warren, then Assistant Surgeon General, reemphasized the preventive nature of medical care in a statement which is still pertinent today:

"In these days of progress in preventive medicine there is some tendency to separate too sharply the preventive from curative medicine. It should not be forgotten that an adequate medical service to the whole people will do more to prevent disease and disability than any other single measure to be considered."<sup>8</sup>

#### REFERENCES

1. Strauss, Henriette. Health Education in Hospitals and Out-Patient Departments. *A.J.P.H.*, 35, 11:1175 (Nov.), 1945.
2. Alvarez, W. C. How to Avoid Flare-ups of Peptic Ulcer. *J.A.M.A.*, 125:903 (July 29), 1944.
3. *Annual Reports of the Supervising Surgeon of the Marine Hospital Service, 1872-1884.*
4. Terris, M. An Early System of Compulsory Health Insurance in the United States, 1798-1884. *Bull. Hist. Med.*, 15, 433 (May), 1944.
5. *Pub. Health Rep.*, 31:1919 (July 21), 1916.
6. Medical Care in a National Health Program. *A.J.P.H.*, 34:1252 (Dec.), 1944.
7. Warren, B. S., and Sydenstricker, E. Health Insurance: Its Relation to the Public Health. *Pub. Health Bull. No. 76* (Mar.), 1916.
8. Warren, B. S. A Unified Health Service. *Pub. Health Rep.*, 34:377 (Feb. 28), 1919.

# A Method for Control of Sanitation in Food Processing Plants\*

REESE H. VAUGHN AND THRESSA C. STADTMAN

*Division of Food Technology, University of California, Berkeley, Calif.*

RECENT increased demands for production of all types of foods have again emphasized the difficult problem of adequate control of food plant sanitation. Several recognized methods which are available for such control include a number of agar contact methods<sup>1-4</sup> and the recently proposed standard method for control of food utensil sanitation.<sup>5</sup>

In connection with studies on the microbiology of dehydrated vegetables, it became necessary to select a method for control of plant sanitation in order to control microbial souring of vegetables during the process of dehydration, and to reduce the microbial populations of these dehydrated foods. Preliminary tests were made with the agar disk method,<sup>1,2</sup> the agar contact plate,<sup>4</sup> and a swab, smear plate method originating with the authors. These methods were found entirely inadequate because the large populations generally found on various pieces of processing equipment afforded such abundant colony development on the surface of the agar that no reasonable estimate of the numbers contaminating a given surface could be made.

To overcome the inadequacy of these different methods for the problem at hand, tests were made using the swab technique method recently recommended for control of food utensil

sanitation.<sup>5</sup> Again, the high population levels created difficulty in obtaining adequate estimates of the numbers of microorganisms contaminating the surfaces of equipment such as conveyor belts, cutting knives, dehydrator trays, etc.

To obviate this difficulty and at the same time accurately control the surface area sampled, instead of estimating it as proposed in the standard method,<sup>5</sup> a guide was constructed having a central rectangular opening which would expose exactly 4 sq. in. of surface for sampling (see Figure 1).†

The guides first used were of medium gauge stainless steel having a central opening 1 x 4 in. These guides were found to be satisfactory as they afforded accurate surface sampling. The proposed standard method,<sup>5</sup> somewhat modified, was then found to be satisfactory for control of equipment sanitation.

## THE METHOD

*Equipment and Materials* — The equipment and materials necessary for the method include sterile swabs, sterile guides, sterile 99 and 9 ml. dilution blanks, sterile Petri dishes, sterile 1 ml. pipettes, sterile forceps or scissors, and suitable agar media for plate counts.

The swabs, made with firmly twisted

\* A report on a joint research project of the Quartermaster General's Office, U. S. Army and University of California.

† Adapted from Gilcreas, F. W. *Methods for Examinations Concerned with Eating, Drinking and Cooking Utensils* Methods for Approved Laboratories, New York State Dept. of Health, 1940 pp 8-9.

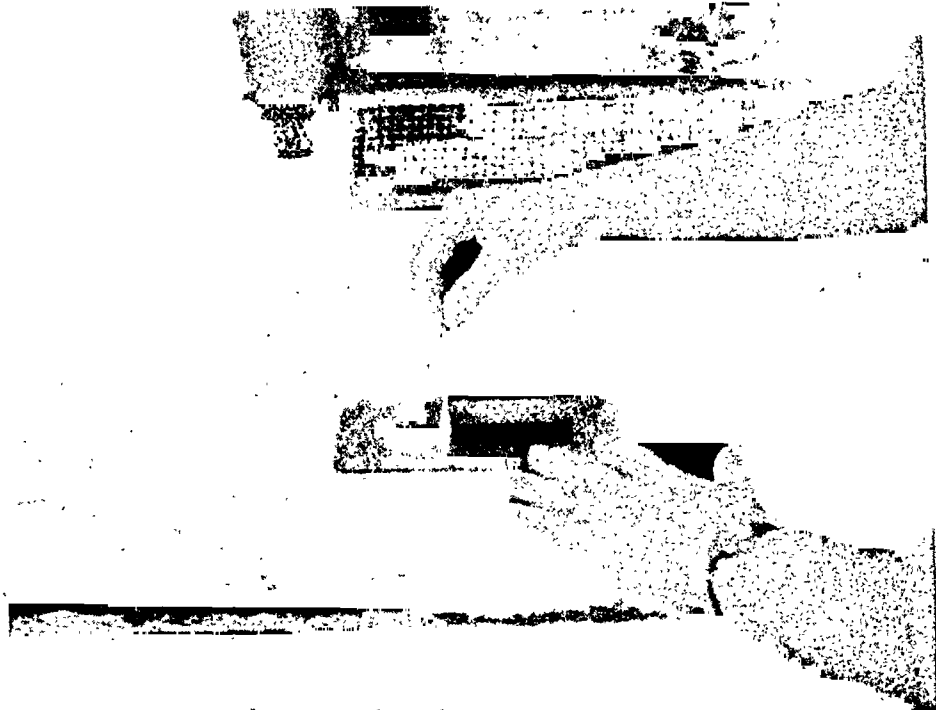


FIGURE 1

absorbent cotton, were approximately  $\frac{1}{4}$  in. in diameter and 1 in. long affixed to wooden applicator sticks approximately  $\frac{1}{16}$  in. in diameter and  $6\frac{1}{2}$  in. long. Sterile, dry swabs were stored in groups of 5 in sterile, cotton plugged 1 x 8 in. test tubes.

It is imperative that the swabs be  $\frac{1}{4}$  in. in diameter in order to sample rough wooden surfaces; smaller swabs are not satisfactory as they tear apart too easily.

The stainless steel guides previously described were wrapped individually in several layers of heavy wrapping paper and sterilized. (If a portable butane or other "bottle gas" burner or blow torch is available the guides may be sterilized by flaming.)

Dilution blanks were prepared in 99 ml. quantities in 6 oz. screw-cap prescription bottles. The blanks contained Butterfield's phosphate solution<sup>6</sup> with addition of sodium thiosulfate to counteract any chlorine

picked up with the swab sample. Additional 9 ml. blanks containing the phosphate solution, distilled or tap water, were prepared for dilution of the original sample. These blanks were prepared in  $\frac{3}{4}$  x 6 in. tubes with cotton plugs.

The glassware was sterilized in the usual manner in an electric oven at  $150^{\circ}\text{C}$ . The swabs, guides, dilution blanks, and other equipment and media were sterilized in the autoclave at  $120^{\circ}\text{C}$ . for 20 minutes.

*Collection of Samples* — Conveyor belts, trim table belts, guides, shields and other surfaces suspected of contributing to contamination of the vegetables in process of preparation for dehydration were examined. The suspected surface was sampled at random using the stainless steel guide to permit the sampling of 4 sq. in. of surface area with a sterile swab thoroughly moistened in the sterile phosphate solution. The sterile, moist swab was scrubbed over

the selected area for 30 seconds (or until the surface was noticeably dried) and then broken or cut off aseptically from the contaminated end of the swab stick into the 99 ml. dilution blanks. The resulting sample was then prepared for immediate dilution by vigorous shaking by hand (approximately 100 times) until the cotton swab was completely disentangled from the end of the applicator stick. The shaken sample, considered as a  $10^{-2}$  dilution was then plated out in appropriate dilutions using suitable agar media. After incubation the plates were counted and the numbers expressed as microorganisms per 4 sq. in. of surface.

*Agar Media Used*—Unlike ordinary sanitary control work where it is possible to select a given test organism, in studies on control of sanitation in food production plants such a selection is impossible. Yeasts, molds, and various bacteria contribute to excessive contamination in a food plant. For example, in potato as well as other vegetable dehydration plants one may find significant numbers of coliform bacteria, aerobic bacilli, and yeasts making up the total population of the surface examined. Since representatives of each of these groups may contribute significantly to deterioration of the potatoes or other vegetables before they are completely dehydrated, it is obvious that a single agar medium is not enough. In all work on the sanitary aspects of vegetable dehydration three or four agar media have been used: Levine's eosine-methylene-blue agar for the coliform and other Gram-negative bacteria; yeast infusion glucose agar\* for lactic acid bacteria and yeasts,

Difco tryptone glucose agar for enumeration of acid or alkali-forming organisms and standard nutrient agar because it is such a widely mis-used medium for industrial control work. No special medium was used for the molds since, if significant spores or fragments of mycelium were present, the yeast infusion glucose agar supported their growth satisfactorily.

In most cases results were recorded as numbers of microorganisms per 4 sq. in. of surface examined without attempting to enumerate the kinds of microorganisms other than to recognize whether the colonies were molds, yeasts, or bacteria. With eosine-methylene-blue agar, however, it was possible to recognize representatives of the genera *Escherichia* and *Aerobacter*.

*Application*—Since July, 1944, when the method was first developed for use in connection with control of contamination of processing equipment in a vegetable dehydration plant, the method has been tested repeatedly in twenty dehydration plants and in several frozen foods plants preparing quick-frozen vegetables. The method, if used as directed, has proved satisfactory for control of sanitation in these food production plants. The method is particularly adapted to use in the field under adverse conditions and, in fact, has been used almost entirely under field conditions in California, the other Pacific Coast states, and Idaho.

*Limitations*—It is to be stressed that this method has certain limitations. The most serious objection arises when attempting to sample rough wooden surfaces such as those found on dehydrator trays, fruit and vegetable lug boxes, etc., made with rough finished lumber. The rough surfaces invariably tear the swabs. Furthermore, it is doubtful if these surfaces are ever adequately sampled because much of the contaminated debris is imbedded below the contact surface reached by the

\* This medium is prepared by autoclaving 200 gm. of fresh baker's yeast cake in a liter of water for 30 minutes at  $120^{\circ}\text{C}$ . The infusion is allowed to stand for the purpose of settling out most of the solids, the supernatant is decanted off and clarified by filtration or used directly. One to 2 per cent glucose and 2 per cent agar are added to the infusion, and the medium is sterilized at  $120^{\circ}\text{C}$ . for 20 minutes.

swabs. Fortunately, little equipment of this nature has been encountered in most plants.

As previously stressed,<sup>6</sup> it is questionable whether all or a fixed percentage of organisms can be removed from a given surface. This is certainly true in the case just discussed and, in all probability, in the case of all surfaces, rough or smooth.

Too, the dilution solution is not favorable for maintaining prolonged viability, so plating must be done within a few hours or preferably immediately after sampling. Rather than contend with the possible diminution in numbers of viable organisms in the original sample on storage for even a few hours, it is recommended that the sample be plated immediately.

In addition the usual vagaries of the dilution and plate count technics have to be tolerated.

Nonetheless, the method as outlined above may be used successfully to control sanitation in food processing plants.

*Other Suggested Uses*—Since first using the stainless steel guides for sampling flat surfaces, occasion has arisen to sample contoured areas. Simple circular or angular areas may be sampled successfully with the stainless steel guides properly bent to fit the desired arc or angle. These, however, are not readily applicable for complexly contoured areas. For this purpose it is suggested that guides be prepared from malleable sheets of aluminum, tin, or lead, or foil sheets of these metals, or even from cellophane or paper. The malleable sheets, foil, cellophane or paper guides can be fitted by hand to cover readily all manner of contoured areas and should find ready application in the method proposed for control of food utensil sanitation.

The use of guides affords reasonable accuracy in sampling a given area, thereby eliminating any possible error

arising from inaccurate estimation of a given area.

The malleable metal and paper guides may be wrapped and sterilized in groups, but the cellophane guides must be separated by paper lest they fuse together on heating.

The opening in the guide may be square, circular, or rectangular. The rectangular guide was chosen because it afforded easier use of the swab and at the same time covered a longer portion across the length and breadth of the equipment being sampled. An area of 4 sq. in. was chosen because it had been previously recommended for sampling food utensils.<sup>5</sup> A smaller area is difficult to swab accurately. A larger area in the experience of the writers would be wasteful of materials and equipment because of the very large numbers of organisms which would be encountered under certain conditions.

Although results are expressed as numbers of viable organisms per 4 sq. in. of surface, there is no reason why they might not be expressed in terms of other units (per sq. cm., per sq. in., per sq. ft.).

*Interpretation of Results*—There are several factors which complicate proper interpretation of this method as applied to control of sanitation in food production plants. The numbers of microorganisms contaminating equipment are far in excess of those customarily encountered on food utensils and containers, etc.<sup>1-4, 7-9</sup> The nature of the equipment and its design influence the ease with which it may be cleaned. The food plant may operate 24 hours a day.

The conveyor belts and other equipment in contact with the food product being prepared certainly, if properly cleaned, should not contribute to the build up of a microbial population in the product above the normal population for the product at any stage in the process of preparation. Thus, pre-blancher equipment should naturally be

expected to carry a higher microbial population than post-blancher equipment. In the absence of the blanching process all equipment should carry a uniform light load of contaminating organisms if control of sanitation is to be considered adequate.

Whether the customary "clean-up" procedure including scrubbing, the use of a high pressure steam cleaning hose, application of a sterilizing spray, and a final hosing down with potable water is an effective practice for cleaning is problematical.

Results obtained to date indicate that there is a serious need for some method affording continuous cleansing of conveyor belts, many of which at present frequently are in operation for 10 to 18 hours without having been cleaned.

#### SUMMARY

1. A method for determining the bacterial contamination of food production equipment surfaces has been described.

2. The method, a modification of the recently proposed method for control of food utensil sanitation, allows for accurate sampling of any accessible surface area by the use of a guide which permits the swabbing of a given rather than an estimated surface area.

3. The method, with malleable sheet, foil, cellophane or paper guides, may be applied to irregularly contoured surfaces. Stainless steel guides are recommended for flat and regularly contoured surfaces.

4. The method is more satisfactory for use in studying and controlling bacterial contamination in food production plants than any other proposed method which has been investigated.

#### REFERENCES

1. Hammer, B. W., and Olson, H. C. Bacteriology of Butter III. A method for studying the contamination from churns. *Iowa Agr. Exp. Sta. Res. Bul.*, 141:229-248, 1931.
2. Olson, H. C., and Hammer, B. W. The Agar Disc Method for Studying the Contamination from Metal Surfaces. *Iowa Agr. Exp. Sta. Bul.*, 300:323-335, 1933.
3. Walter, W. G., and Hucker, G. J. Proposed Method for the Bacteriological Examination of Flat Surfaces. *A.J.P.H.*, 31:487-490, 1941.
4. DeLay, P. D. Contact Plates and Army Inspection of Food Plants. *Army Veterinary Bul.*, 37:1-7, 1943.
5. Tiedeman, W. D., et al. A Proposed Method for Control of Food Utensil Sanitation. *A.J.P.H.*, 34:255-258, 1944.
6. Butterfield, C. T. The Selection of a Dilution Water for Bacteriological Examinations. *J. Bact.*, 23:355-368, 1932.
7. Fellers, C. R., Levine, A. S., and Harvey, E. W. Bacteriological Examination of Glassware or China for Sanitary Quality. *A.J.P.H.*, 26:1211-1214, 1936.
8. Speck, M. L., and Black, L. A. Effectiveness of Cotton-swab Methods in Bacteriological Examination of Paper Ice Cream Containers. *Food Research*, 2:559-566, 1937.
9. France, R. L., Fuller, J. E., and Cassidy, W. E. Laboratory Examination of Eating and Drinking Utensils. *A.J.P.H.*, 33:1054-1064, 1943.

# Problems of Health Education in Latin-America

GERMAN CASTILLO, M.D., M.P.H.

*Managua, Nicaragua*

**F**OREMOST among the great medico-social problems of all ages and of all countries there stands out the problem of public health, and the necessity for educating the people as a whole in its basic principles.

Health education brings into action all the knowledge of medicine, of hygiene and of pedagogy. In the modern concept of social justice, health education is a factor that, by itself, offers the greatest of benefits—health, taught with an altruism that gives without either asking or expecting any monetary compensation. It is the beacon of the science that aims at the enlightenment of all the beings upon earth, equally, and awakening in all consciences a desire for the well-being and happiness of all mankind.

With such a concept, health education in our Latin-American countries must include the following features:

1. It must convey to the minds of all cultural levels the basic principle of the importance of health as an element of life and personal prosperity.

2. It must eliminate the incomprehension, the ignorance, the prejudice and the superstition so common in our countries

3. It must teach the concept of hygienic life, of good alimentation, of clean lodging, and the prevention of illness.

4. It must carry to the conscience the recognized principle that the individual, the citizen, is only a part of the social and national whole; and for that reason the health and well-being of all the people are only human functions that contribute the economic improvement and individual prosperity as a collective part.

After these general considerations, let us see how the educational work must be carried out in our countries.

(1) Make an investigation of the general health problems and of the illnesses that are most frequently endemic and epidemic; and also investigate the standards of cultural and economic life of the inhabitants. (2) Adopt methods that are suitable to the problems of the particular countries or regions, giving due consideration to their sanitary necessities, their economic capacities and the prevailing manners of living of their peoples.

To conduct the campaign adequately we must have a complete knowledge of the land in which we are going to work; we must know its geography, its history, its traditions, and its routes and means of communication. We shall have to know the predominant character of the population, the general culture and psychology of the people, the influence of religion, and the respect for authority. And, furthermore we must make a study of the region's statistics, its economic status, and any progress the inhabitants may have made toward their own social and economic improvement. In addition to all this we shall have to have a sufficient force of trained personnel, together with adequate medicines and equipment, and the funds necessary for an efficient and long campaign. We must have unlimited patience, because a work of this magnitude cannot be



completed in a short time—in fact it will have to be carried on indefinitely.

We know that if we want to get to the masses, and especially to those of very little culture, we need men with knowledge, and with altruism in their hearts—men who are scientific and human at the same time.

Our Latin-American countries, so varied in their aspects, with climates, altitudes, configurations of territory and natural wealth so different, have many characteristics in common: Our language and our origin are the same; our religion, our customs, and our general culture are the same; we all have Indians, mestizos, and whites; our virtues and our shortcomings are similar; our hardships and our calamities are common to all of us.

In the teaching of health education we must take into consideration the differences between the man of the city and the man of the country: The former is more comprehending than the latter; he has the opportunity to learn without great effort, while the contrary is the case with the rural individual, who lives more or less in isolation. But, even in the city we must distinguish between the high, the middle, and the low class man, as each of these has a different cultural level. And further, if we go to the rural part of the country, in some zones we find mestizos and civilized Indians, but in others we still find Indians who speak only their own dialect and who cling to the customs of their ancestors, thereby making it a difficult problem to give them any kind of an education.

It can easily be seen what a difficult task the teaching of health education is under such conditions. In order to be successful one must exercise unlimited patience, coupled with technical knowledge and the right psychology—for any attempt at coercion would awaken the latent antagonism of the community and result in failure. It is not easy to

change the firmly fixed unhealthful and insanitary habits of the primitive natives, who are not readily receptive to reason and to things they do not understand. To be successful one must obtain the coöperation of the people, which can be had only by arousing their interest, and by simple, convincing proofs—never by academic arguments that are beyond their comprehension.

After considering all these complicated problems involved in the establishment of public health education in Latin-America, we are forcibly confronted with the enormity of the task with which we, the future health educators, are faced.

I shall now mention one of the problems that to me seems to be of paramount importance: that is, the infant mortality rate, which is not only medico-social, but also economic-social and cultural. Its solution can bring the most success to the health education movement, because that rate is capable of substantial reduction, provided adequate public coöperation can be obtained.

We know that our abnormally high infant mortality rate—which is one of the highest in the world—is the result of numerous causes: bad inheritance, ignorance, poverty, illegitimacy, malnutrition, and communicable diseases, all coupled with a deplorable lack of medical assistance and health education. Facing so complex a problem, and bearing in mind the fact that the higher infant death rate in the Latin-American countries occurs among the poor, illiterate, and ignorant people of both the city and the country, we ask: "What can and must be done to improve this condition?" We know that, according to the principles of eugenics, every child comes to birth with a biologic heritage transmitted to him from his forebears. But we know also that the new child, whatever its origin, has the right of investigation of

its heredity, and also the right of protection in and out of the maternal womb.

The preservation of the life of the mother, as well as that of the child, from the medical and economic point of view is the duty of the State, not as a charitable and sentimental act, but as an inevitable obligation that calls for a protective and educational organization in the interest of the general public welfare and advancement. For a long time all this has been under consideration in many of our countries, but always we have been confronted with the same grave difficulties. What are these difficulties? They are not a lack of suitable laws; they are a lack of understanding on the part of so many people, caused by an excess of ignorance, poverty, prejudice, superstition, and indifference.

There is a want of good lodgings and nourishing food; there is little opportunity for sufficient rest and recreation; there is an excess of illegitimacy, immorality, and preventable illnesses; and there is a woeful lack of physicians, nurses, and instructors. And further complicating the situation, is the large number of unprincipled persons, politicians and blackmailers, preying on the unsuspecting people.

What can we do to overcome these deplorable conditions? Infant mortality is a medico-social problem, and health education cannot accomplish a complete and lasting reform without the coöperation and help of other elements of society. Such help is necessary in order to improve the condition of the more or less ignorant Indians, rural workers, and peoples of the middle and lower classes. Illiteracy must be eliminated as far as possible, by the creation of schools to serve the entire population; protective laws must be enacted; inadequate wages and salaries must be increased; and an effective organization must be established for the proper care of pregnant mothers and

their infants, together with education of the mother, to be carried on also for a sufficient time after birth.

From the hygienic point of view health education is an irrepressible necessity for the lessening of infant mortality.

The heredity factor, which has a great influence in the development of a new life, is embraced in the science of eugenics—the science that takes first place in the process of life. Therefore the premarital health certificate is of the greatest importance for the protection of the child that is to be born. Practical polygamy, illegitimacy, and promiscuity must be eliminated, or at least reduced to the lowest degree possible. Here again health education comes to the rescue, for the eugenic conscience is the best certificate.

As soon as the new life is conceived, whatever its paternity may be, we must bring into effect the prenatal hygienic care that protects the mother as well as the child. In reality, maternity should not constitute a serious problem, and should not have complications, since it is a purely natural biological occurrence and is the result of an eternal law that tends to conserve the species. Even so, it is the most hazardous epoch in the life of a woman. In this connection the visiting nurses, the physician, and the midwife are auxiliaries, advisers and conductors—health education teaches all the necessities.

Birth hygiene completes the materno-infantile cycle at the oncoming of the new life brought to the world with aseptic materials and scientific aid. Maternity wards, hospitals, physicians, and midwives are indispensable requirements to insure safe birth. Also, there must be protection for the child's eyes, and scrupulous cleanliness of person and surroundings. All these things will be taught in advance by health education.

Then comes child hygiene. The new-born child is fragile and helpless, and it requires constant and scientific protection. And again the mother must have scientific advice and be guided thereby.

In our countries, which have so great an infant mortality, we must concentrate our principal attention on the child. The first year of life is the one in which there is the greatest danger—not because of any lack of love or lack of nutrition from the mother, but because of the ignorance about regulation feeding that exists in the middle and lower classes, and because of the poverty that does not permit of proper attention. We must advocate, not only breast feeding whenever possible, but also scientific technique in furthering the health and development of the child. For the poorer classes milk stations must be established, not only as a matter of health protection, but also for educational purposes.

After the first year of life, and before arriving at the school age, the mother, the child clinic, and the nursery prepare the child for the future. Preventive medical methods conserve its health. Immunization against certain diseases, happiness in the home, and the regimen of normal life are protective in the life of the child. Here is where health education provides the foundation for a strong and active life to come.

At length comes the school life, when the child opens his eyes to the light, when his future is beginning to be shaped. This is the age when hygienic teachings take a large part in the protection of his life; and also the courses of study at school and the accompanying social life are providing instruction and experience whereby he learns to defend himself, not only in a physical sense but also in the matter of health, by forming habits of hygiene. All this can be achieved through an

efficient system of health education.

We must educate the child by requiring him to study and practise general hygiene and school hygiene; by teaching him the fundamentals of eugenics, puericulture, and sexual hygiene; and by means of classes in physical education and mental hygiene.

For the development of a program of this kind we must enlist the services of teachers already experienced in health education, of specialized nurses and of competent hygienists who know how to conduct a campaign of this character. It is indispensable in this stage of the child's life that the best and most modern methods of health education be used. It is in the school that we find the best opportunity for developing modern health education from the technical point of view; but it is in the home where the practice must be developed; and it is from the coöperation of both whereby the greatest benefit will be obtained.

From this brief description of the life of the child, we can see that health education constitutes the only means by which infant mortality can be reduced, now and in the future.

We know also that if the child is very poor we must give him more; if he is helpless he requires greater protection, which is his right as a human being—and society and the State are morally obligated to provide that protection.

In modern and civilized nations there is no justification for marriage where there are physical or pathologic impediments. On the other hand, in the opinion of the author, there is no justification for controlling or preventing conception if there are no paramount physical, medical, or pathologic reasons to the contrary; and there is still less justification in stopping the development of the fetus by means of premature expulsion.

No child should die at birth from

tetanus or from any other preventable cause, since he has the right to be born under aseptic conditions and with expert aid. Furthermore, the child has the right to proper care after birth, as needed to eliminate the danger of contagious disease, such as syphilis. He has the right to have a father and a mother, though they are not married, because he has had no choice in his progenitors; he has not asked to be brought into the world—and he is entitled to the best that we can possibly give him.

Also, he has the right to be developed in a healthy mother, and in a sanitary and suitable home.

He has the right of having his mother properly cared for, in comfort, and in sanitary surroundings, both before and after his birth.

He has the right to the maternal breast, carrying with it normal and proper nourishment for his start in life.

He has the right to sanitary and educational care during his preschool life.

He has the right of being protected against contagious diseases, and of being physically prepared to enter school.

He has the right to preliminary kindergarten instruction and primary education, all as an obligation of the State.

He has the right to a specialized and vocational education, according to his talents.

He has the right to adequate nourishment according to his physical requirements.

He has the right to think and discriminate for himself, leading to the

development of his own personality, so that he may make a success of his life.

He has the right to reasonable means for his subsistence and his education, so that he may find and take his place in society.

He has the right to have a home, a family, and a piece of land that he can work and improve as a free man.

He has a right to all necessities of life, and to happiness and freedom from worry.

And above all and after all, he has a right to a free life, to be a free man, as a member of a society, as a citizen of a country, small or large—for life, in the larger sense, is synonymous with health, energy, honesty, work, joy, culture, and happiness, all combined.

The child has all these rights—but he also has a duty to himself, to his country, and to humanity. His duty is to be a man, good and virtuous. The three attributes—good heritage, good habits, and good education—embrace the Aristotelian philosophy of life. These are all-inclusive, and they constitute our goal for all the people, as set forth in this discussion.

The establishment of health education in a country is a constructive undertaking; it will teach the public the modern methods of combating disease; it substitutes intelligence and reason in the place of ignorance; and it is the contribution of the State in the campaign to eliminate, or at least greatly lessen, prevalent and prospective public ills and calamities. It is light dissipating darkness. It is the future taking the place of the past. It is culture. It is civilization.

# Treatment of Pediculosis Capitis

JOSEPH G. MOLNER, M.D., M.P.H., F.A.P.H.A.

*Deputy Commissioner and Medical Director, City Department of Health,  
Detroit, Mich.*

DURING the war years, a greater emphasis has been placed on the control of *pediculosis capitis*. This increase in the interest in this infestation has been preceptitated largely by the fact that as much as a tenfold increase in the condition has been noted and, too, because of the relationship of typhus fever to pediculosis. The increase in the crowding index of populations in the urban districts of war areas and the influx of peoples of all classes from many sections of the United States, as well as certain foreign countries, have contributed to this problem.

The principal methods of control are prophylaxis and the treatment of those patients infested with the vermin. Personal cleanliness is the first prerequisite in the control of human lice infestation. It can hardly be questioned that at least weekly baths with warm water and soap, with frequent changes of clean clothing, would reduce the frequency of secondary infestation. On the other hand, crowding and intermingling of population groups in dwellings, in industry, places of amusement, and aboard common carriers increase the risk of infestation. It is not unusual in a large, crowded community to see louse infestation among clean families.

The control of pediculosis by treatment of the active cases has been very discouraging in the past, largely because the lousicides available were only of limited value and required a great deal of time and effort by the patients. The materials used and recommended were

usually good or fairly good lousicides but would not destroy or loosen the nits. The destruction or removal of the nits was contingent upon secondary treatment with manual or mechanical removal. The tedious nature of such treatment can actually discourage even the most coöperative patient, and yet adequate treatment is not possible without the removal of the nits, because these nits, unless destroyed or removed from the hair, will hatch in about 7 days, and the cycle of reinfestation is reëstablished. The potentialities of such reinfestation can only be evaluated when one recognizes that each female louse is capable of laying 50 to 150 eggs, and that the average louse will live for a period of 30 to 40 days.

## TREATMENT

Treatment of pediculosis has resolved itself to experimentation with many of the known proprietary compounds and some relatively unknown products. The use of DDT<sup>1</sup> powder for *pediculosis corporis* is unquestionably a treatment exceeding in effectiveness all other treatments tried. It is probable that some form of this product may be developed that will be equally effective against *pediculosis capitis*. In the meantime, other products have been tried with unusually good results. A 20 per cent solution of Phenyl Cellosolve<sup>2</sup> in 60 per cent ethyl alcohol has been used by the writer with good results.<sup>3,4</sup> Over 500 persons have been treated with this material in both 40 and 20

per cent solutions. The disadvantage of Phenyl Cellosolve is largely the fact that it is not freely available.

In a rather short article, Blackstock<sup>5</sup> reports the use of a proprietary compound referred to as ascobial for the treatment of *pediculosis capitis*. This compound, to the best of the knowledge of the writer, is similar to the 50 per cent emulsion of benzyl benzoate,<sup>6</sup> extensively used in the treatment of scabies. This product was experimentally used by the writer in coöperation with public health nurses and social welfare workers with excellent results. A 50 per cent emulsion of benzyl benzoate was diluted with equal parts of tap water and applied to the hair and scalp with some modification of the Blackstock technique. Twenty-five households, representing 263 persons, were treated by this method without the recognition of a single failure. In three instances, lice were found 3 weeks after the first application of treatment but these three apparent failures were attributed to reinfestation, and sufficient evidences of exposure were available to justify this conclusion.

#### PROCEDURE OF TREATMENT

1. The hair must be carefully shampooed to remove all oil and dirt.
2. Allow the hair to dry.
3. Have the patient sit in a chair and tilt his head slightly backward.
4. Cover the patient's neck and shoulders with a towel or some similar cloth.
5. Cover the eyes with folded pieces of paper towelling.
6. Apply 25 per cent benzyl benzoate emulsion with a large absorbent cotton swab or 1½ inch flat paint brush. Apply generously to the hair and scalp, starting preferably from the hair line and working the material against the nap of the hair. The treatment should be applied generously to give assurance of thorough contact of the medication with hair and scalp.
7. Comb the hair in the usual manner.
8. Twenty-four hours later shampoo the hair carefully.
9. Allow the hair to dry—comb and brush thoroughly.

This procedure should be carefully followed and, if adhered to, excellent results may be obtained. The crusting and scalp infection occasionally observed with *pediculosis capitis* was seen to clear up remarkably well in this series of cases.

After the course of treatment, no live lice are found, and the nits that remain are loose and easily brushed out of the hair. It was also observed that these removed nits present the appearances of shells rather than the firm, adhesive and pearly-white characteristics of the nits in untreated heads.

The patients may complain of a slight irritation of the scalp. These complaints are more frequent with heavy infestations of long standing. This is probably due to the fact that the scalp has been excoriated with the continued scratching. It should be noted that some reactions to benzyl benzoate have been noted in the literature. Daughtry<sup>7</sup> reports some local reactions in cases treated with benzyl benzoate for scabies. These observations by Daughtry and those observed by the writer are not of sufficient importance to contraindicate the use of a lousicide or scabicide as effective and efficient as benzyl benzoate.

#### SUMMARY

Benzyl benzoate emulsion, 25 per cent, is reported as an excellent treatment for *pediculosis capitis*.

Its efficiency as a lousicide and its availability make this treatment the most desirable.

No serious complications or failures were observed in this series of treated cases.

#### REFERENCES

1. 2, 2-bis(p-chlorophenyl)—1, 1, 1-trichloroethane; or dichlor-diphenyl-trichloroethane.
2. Manufactured by the American Carbide and Chemical Company.
3. Davis, W. A., Treatment of *Pediculosis Capitis*. *J.A.M.A.*, 123, 13:825-826 (Nov. 27), 1943.
4. Davis, W. A., and Juvera, P. M. Studies on

Louse Control in Civilian Populations. *Am. J. Hyg.*, 39, 2:177-188 (Mar.), 1944.

5. Blackstock, Eric. Treatment of Pediculosis Capitis. *Brit. M. J.*, 1:114-115 (Jan. 22), 1944.

6. Benzyl benzoate emulsion, 50 per cent. The

material used in this study was made available by Burroughs Wellcome and Company.

7. Daughtry, D. C. Complications Following a Rapid Treatment of Scabies. *J.A.M.A.*, 127, 7:88-89 (Jan. 13), 1945.

## Advisory Health Group Meets

At a meeting of 30 leaders in public health and civic activities called by the Department of State under the Chairmanship of Dr. Thomas Parran in October, prompt action in developing an international health organization was urged. The group recommended that the United States Government associate itself immediately with other nations in taking steps leading to the early formation of a new and broad international health organization, to be closely linked with the Economic and Social Council of the United Nations.

Certain general functions visualized for the organization are the collection and analysis of world-wide disease statistics as a basis for epidemic control; assistance to national health services to control diseases at their sources; centralization, consolidation and subsequent distribution of health and medical knowledge; standardization and control of drugs and other therapeutic agents.

Under Secretary of State Dean Acheson reported that the delegates at the United Nations Conference on International Organization in San Francisco had unanimously approved calling a general conference for the purpose of establishing an international health organization. He further stated that the department had received notes from Brazil and China requesting the United States to join with them and the United Kingdom, the U.S.S.R., and France in sponsoring the organization.

Attention was directed by the advisory group to the destruction in Europe and Asia of facilities for the maintenance of health and to the dis-

persal of trained health personnel. Emphasis was placed on the urgency of the need for reconstruction and the early application of new discoveries in the field of medicine and insect control in order to prevent the spread of epidemics during the post-war period.

Members of the group made specific suggestions as to the scope and structure of the contemplated new organization, and urged that the United States use its influence to create an organization which would be technically competent and at the same time representative of the interests of the peoples of the world.

Among those attending from the field of public health were:

Margaret Arnstein, R.N., Consultant Public Health Nurse, State of New York Department of Health

Walter L. Bierring, M.D., Commissioner, Iowa State Department of Health

E. L. Bishop, M.D., Director of Health, Tennessee Valley Authority

Frank G. Boudreau, M.D., Director, Milbank Memorial Fund

Louis I. Dublin, Ph.D., Second Vice-President and Statistician, Metropolitan Life Insurance Company

Kendall Emerson, M.D., Managing Director, National Tuberculosis Association

G. Ford McGinnes, M.D., National Medical Director, American Red Cross

Lowell J. Reed, Ph.D., Dean, Johns Hopkins School of Hygiene and Public Health

George Strode, M.D., Director, International Health Division, Rockefeller Foundation

William H. Taliaferro, Ph.D., Department of Bacteriology and Parasitology, University of Chicago

C.-E. A. Winslow, Dr.P.H., Editor, *American Journal of Public Health*

Abel Wolman, Dr.Eng., Professor of Sanitary Engineering, Johns Hopkins School of Hygiene and Public Health

# The Journal Is 35 Years Old

REGINALD M. ATWATER, M.D., F.A.P.H.A.

*Chairman, Editorial Board, and Managing Editor*

IN 1945 the thesis of a candidate for the Degree of Master of Public Health analyzed health education material and its changing emphases in the *Proceedings* of the Association beginning in 1873, and in the *Journal* to the present time. It was logical and intelligent to start with the annual volumes of *Transactions* and to regard them and the *Journal*, when it came along, as one and the same thing. For the *Journal* did not spring up like a mushroom in 1911. It evolved; it evolved from the single yearly compilation of *Reports and Papers of the American Public Health Association* to give a growing profession a more dynamic publication schedule.

The *Proceedings* and the *Journal* are a cross-section of the thinking and growth of the Association itself. Of the former Dr. Wilson G. Smillie has said "The first volumes are a mine of information, for they indicate the vital matters that concerned the leaders of that day. Many of the principles that were presented in the very first report have become the foundation stones on which public health in America has been built."<sup>1</sup> But it is the *Journal's* birthday that is being celebrated and, in the best biographical tradition, only the briefest mention can be made of its antecedents.

Of sturdy New England heritage,<sup>2</sup> the *American Journal of Public Health* became the official child of the American Public Health Association in 1909, with Burt R. Rickards as its first editor. It received its present name

in 1912. When Livingston Farrand took over the editorship of the *Journal* from Mr. Rickards and Selskar M. Gunn became its business manager in 1912, the Association numbered only 700 members, but they were geographically representative of the United States, its territorial possessions, Canada, Mexico, and Cuba, and of every field of public health. Dressed in sober Quaker gray for the first half of its life, its cover became the present cheerful orange in 1928, when the *Nation's Health*, previously published by The Modern Hospital Publishing Co., was absorbed.

The early years were precarious for a *Journal* with high ambitions. The printer's bill had frequently to be underwritten by the personal credit of the editor, while much unpaid time and thought went into editorial preparation and distribution, but the purposes remained steadfast to "constitute the medium for the exchange of experiences and methods between health officers of the entire country—administration, office forms and methods, finance, etc.," and to "furnish the medium for publication of papers and abstracts of papers presented at the meetings of the general Association and its Sections and of the proceedings." In 1914 Selskar Gunn succeeded Dr. Farrand as Editor, and he continued in that post until called to Europe by the first World War. In 1918, A. W. Hedrich combined his duties as Executive Secretary of the Association with the editorship of the *Journal* until the end of 1922. In 1923 Dr. Henry F. Vaughan, then



Health Officer of Detroit, became Editor, and Dr. Mazýck P. Ravenel, Associate, with responsibility for the editorial section.<sup>3</sup> Later that year Homer N. Calver succeeded A. W. Hedrich as Executive Secretary of the Association, and became Managing Editor of the *Journal*.

When Dr. Vaughan resigned to become President of the Association at the end of 1924, Dr. Ravenel was asked to guide the destinies of the *Journal*. This task he performed with consummate skill and leadership for sixteen years. These were the years of physical and intellectual growth of the public health movement, when the scope of the *Journal's* interests and influence broadened, its editorial policies were shaped, and its majority attained—all under Dr. Ravenel's wise guidance. The names of the late Dr. C. C. Young and his colleagues on the Committee on Meetings and Publications are powerfully associated with some of this period. In 1938, the present Editorial Board was created, with the writer as Chairman.

In 1941, Dr. Ravenel became Editor Emeritus and Dr. Harry S. Mustard, Director of the Columbia University School of Public Health, succeeded him. For nearly four years the *Journal* bore the imprint of his imaginative and spirited writing. In 1944, however, his duties at the University and his extensive extra-curricular writing made it necessary for him to give up the editorship. His successor was Professor C.-E. A. Winslow of Yale University, who now fills the office with scholarly distinction against a background of long and intimate connection with Association and *Journal* affairs.

To understand the *Journal* it is necessary to understand the Association; of the Association it has been said that it owes its unique position to its ability to attach to itself, in terms of persons, all the professional public

health resources of the continent at every stage of its history. The *Journal* is of the Association membership, by it and for it, and every volume reflects what the members were doing and thinking year by year.

In the present state of public health development, one is apt to think of the health worker of 25 or 35 years ago as concerned almost exclusively with the control of environmental sanitation, control of communicable diseases, and protection of milk and water supplies. But not a single issue of the *Journal* in those early years was confined to these things. Ideas, stirrings, and aspirations expressed in its pages have only just come to flowering. As early as Volume 7 (1917) Dr. William D. Stovall was discussing "Diagnostic Laboratories in Public Health Work," in which he said "The chief concern of state laboratories should be to keep their field of operation from becoming narrow and constricted." This is a seed that resulted years later, in 1941, to be exact, in the publication by the Association of *Diagnostic Procedures and Reagents*, edited by Dr. Stovall.

In 1916 and 1917, Dr. Frankwood E. Williams and Dr. Haven Emerson discussed alcohol as a public health problem. Even today it is difficult to get a hearing with public health workers for their responsibility toward the alcohol victim.

In Volume 7 also "New Ideas in Food Control" by Harry E. Barnard presaged the present-day attention to nutrition and vitamin deficiency as factors in public health. It said "There is more than passing interest in the fact that practically the only real studies of nutrition reported up to a few years ago were confined to the investigations of animal nutrition."

The *Journal* has been the testing and proving ground for ideas, particularly in the development of standards of public health administration, professional

qualifications of public health workers, and standard methods for laboratory and other procedures. Warning against a headlong rush toward standardization, Dr. Wade H. Frost's cool reasoning in the April, 1936, issue stands as a reminder that "the urge for authoritative pronouncements" needs to be severely limited lest they restrict "the freedom of discussion which is the most essential function of the Association."

History is recorded in names as well as in events. This is especially true of a *Journal* whose progress marches forward on the pens of its contributors. Here are illustrious names—Dr. Peter H. Bryce, Dr. Charles V. Chapin, Dr. W. A. Evans, Dr. Eugene R. Kelley, Dr. Milton J. Rosenau, Professor William T. Sedgwick, Professor George C. Whipple and Dr. William C. Woodward as early Board of Advisory Editors; Dr. Haven Emerson, Dr. Henry F. Vaughan, Dr. Allen W. Freeman, Dr. W. S. Rankin, Professor Nathan Sinai, Professor Ira V. Hiscock and Dr. W. Frank Walker as outstanding exponents of good municipal health administration; Dr. Lee K. Frankel, Dr. F. L. Hoffman, Dr. Raymond Pearl, and Dr. Louis I. Dublin for their work in vital statistics and morbidity reporting; Dr. E. R. Hayhurst, Dr. Alice Hamilton, and Dr. Henry Field Smythe for industrial hygiene; Professor Clair E. Turner and Dr. H. E. Kleinschmidt for health education; Dr. William H. Park, Dr. Arthur Lederer, Dr. Edwin O. Jordan, Dr. A. Parker Hitchens, and Dr. Robert S. Breed as representatives of laboratory contributors; Dr. S. Josephine Baker, Dr. Alfred F. Hess, Dr. H. W. Hill, and Dr. Taliaferro Clark as pioneers in child health; Dr. Henry C. Sherman in nutrition; Dr. Harvey W. Wiley in food and drug control; George W. Fuller, Rudolph Hering, Earle B. Phelps, and Abel Wolman for their work in "the remodelling of national life in the light of modern

understanding of sanitary science."

The list of those, living and dead, who have written the *Journal's* history is really much longer. The names of many of them occur throughout the 35 years and appear frequently today. They were part of the 700 members of 1911 and are counted among the 1945 membership of nearly 10,000. (The circulation of the *Journal* this year has averaged 12,700.)

The subjects handled by these and other *Journal* writers cover the entire field of public health. Naturally there have been shifts in emphasis. The world wars jolted what provincialism there was from the *Journal* pages and it is not unusual today to find more than half the articles dealing specifically with matters of world-wide significance, while the page that does not mention world unity is exceptional.

The early issues of the *Journal* are singularly lacking in the discussion of public health nursing problems and in contributions from nurses. Less than a dozen articles by nurses were contributed in the first ten years of publication. Several reasons may account for this gap; there were (and are) two other official journals devoted solely to nursing; the nurses employed in health departments from 1912 to 1925 were fewer than in private agencies (the reverse is now true). In 1923, the Public Health Nursing Section of the Association was organized, the Section "Notes" appeared in 1933, and since that time public health nursing subjects have taken their appropriate place among contributions from other fields.

Recent entrants in the field of public health might consider many of the vexing problems of today quite new, outgrowths of the New Deal, the War, and the public's growing concern with health. Let the pages of the *Journal* disillusion them! Only a few examples are chosen here to show how long ago the seeds were planted.

With regard to national health insurance, in 1913, an article under the title "Public Health Service Not a Medical Monopoly," was followed in December, 1914, by a description of "The Basis of a Sickness Insurance Bill." Health education as a specialized activity deserving its own program was recognized through the *Journal* by the Y.M.C.A. in 1914, in the establishment of a Health Education Bureau. The recurrent question of adequate preparation for health officers concerned the writers of 1912, one declaring in frank discouragement that only 10 per cent were trained, nevertheless citing personal qualities in the untrained group that read like recommended "requirements" of today.

Surveys and studies have always been with us: in 1912, "The Diagnosis of a Sick City," by Dr. George Thomas Palmer, Health Officer of Springfield, Ill., suggested the prime importance of public demand for a thorough survey of the community health situation. Volume 2 (1912) reports a questionnaire on current practices in all cities of 25,000 population or larger in the United States, Canada, Cuba, and Mexico, from which 88 replies were received. Does this not foreshadow the study of the 100 largest cities in the United States finally published in 1923? Thus the current health department surveys of the Association's field staff are descended from a vigorous line of ancestors, direct and collateral.

The Association and the *Journal* have been more than a little occupied in the past three years with the development of a rational plan for the reorganization of local administrative health units, a reorganization that suggests the union of neighboring towns or neighboring counties into larger administrative units. This planning, too, is of honorable descent. In Volume 1, Selskar Gunn, then a professor at Massachusetts Institute of Technology and

Board of Health Agent in a Massachusetts city of 27,000, and C. K. Blanchard, Board of Health Agent of Wellesley, Mass., suggested a union of several towns or cities for local health services following the precedent set by consolidated school districts. In Volume 3, Earle B. Phelps in "An Experiment in Public Health Administration" outlined the coöperation of eight Massachusetts towns in certain health matters—milk inspection, laboratory service, or general administration.

In Volume 2 of the *Journal*, housing problems are discussed, followed by a fairly steady flow of articles on the subject until 1920. Indeed, the amount of space devoted to this topic in the early *Journals* is equalled only by the issues since 1935, when the live interest of the A.P.H.A.'s Committee on Housing, and under the stress of wartime conditions, the subject again claims frequent attention. The same problems are frequently discussed over the years, but the real growth in health standards for housing and methods for a scientific rather than an *a priori* analysis of housing conditions can be traced in the pages of the *Journal*.

Adequate salaries concerned us in 1912—as today. "Adequate" has undergone some favorable changes in interpretation, however, for in Volume 1 we find this startling comment: "Although Ware (Mass.) is a little town of only 9,000 inhabitants, this municipality has been able to pay its health officer (need we say part-time) as much as \$25 a year." As late as 1917, Volume 7 suggests that \$2,000 annually is a fairly good salary for a health officer, but warns that a good sanitarian may have to be accepted, if a good doctor cannot be secured for that salary!

Venereal diseases, to the credit of the *Journal*, called by their proper names from the first without devious euphemisms, are discussed in Volume 2.

The problems of old age disabilities and diseases, called that and not geriatrics, were touched on in 1913; Volume 1 discussed the preventive principles of mental hygiene though the term "psychosomatic medicine" had not burst upon us. Rehabilitation—mental and physical—of the war-worn soldier repeats itself in 1920 and 1945. Interest in personnel policies in administration took root long before 1912 and became a perennial topic, taking on a new growth in 1940 with the Association's interest in the merit system project.

In the 1917 volume there is already evident a real concern with industrial hygiene and public health in such articles as Professor Winslow's "Effect of Atmospheric Conditions upon Fatigue and Efficiency," Richard A. Feiss's "Scientific Management and Its Relation to the Worker," Dr. Francis E. Fronczak's "Modern Chemical Industries and Public Health," Dr. W. H. Rand's "Missing Links in the Chain of Evidence Concerning Occupational Diseases," and Dr. R. P. Albaugh's "The Dangers Connected With the Spray Method of Finishing and Decorating." This variety of subject matter is matched only in some of the more recent volumes.

The *Journal* has made some shifts in departments and coverage. In 1923, Evart G. Routzahn's notes on Health Education and Publicity first appeared. These notes represented a pioneer effort to interpret public health through various publicity media. They continued with uninterrupted interest and vigor until his death in 1939. In 1940, as an outgrowth of these notes, Dr. Donald B. Armstrong began "Credit Lines." In 1933, the Selected Public Health Bibliography was begun by Raymond S. Patterson, Ph.D.—a feature which retains its freshness and originality.

In 1931, the first issue of the Association *Year Book* was published,

bringing together annual committee lists and reports in one convenient issue following the *Journal* in format and typography. All but the first two of the twelve *Year Books* were in fact supplements to the annual February or March issues of the *Journal*. In 1942, the *Year Book* became one of the Association's war casualties—not death but malnutrition from lack of paper, printing, and personnel. The abolition of the *Year Book* has temporarily returned Committee Reports to the *Journal*.

Leafing back over nearly 45,000 pages of the *Journal's* 35 Volumes, one is tempted to trace the dominant trends of interest in each of the specialties, but the task is too great and becomes one for the trained historian and statistician. It is sufficient to say that the *Journal* is a vivid reflection of the history of our times. Wars, depressions, the government's growing share in welfare activities, and now the movement toward world organization, have influenced the *Journal* and the Association's activities just as they do the lives of readers and members. The one world concept is simple for public health workers to grasp; it has been their concept all along. In the words of the present editor: "The aims of the American Public Health Association are primarily technological and relate to the clarification of objectives and the improvement of procedures in the field of public health practice. Public health is, however, one of the most far-reaching of human endeavors. It cannot be limited by national boundaries, since the disease germ operates under all flags."

#### REFERENCES

1. Smillie, Wilson G. *Public Health Administration in the United States*. New York: Macmillan, 2nd Ed., 1941.
2. In 1873, the first volume of the *Annual Reports and Papers of the American Public Health Association* was published in Cambridge, Mass., and

in 1890 appeared the quarterly *Journal of the Massachusetts Association of Boards of Health*. This latter publication was expanded to national scope in 1904, and became the official organ of the A.P.H.A. in 1909. It was taken over by the A.P.H.A. in 1911, and received its present name in 1912.

3. Dr. Ravenel's *Fifty Years of Public Health* had been published in 1921.

NOTE: Grateful acknowledgment is made to the author's associates on the A.P.H.A. staff, in the preparation of this article, especially Mrs. Willimina Rayne Walsh, Miss Martha Luginbuhl, and Miss Dorothy Deming.

---

## The FAO

The Food and Agriculture Organization of the United Nations has already swung into action with the first official meeting in Quebec, Canada, on October 16. The FAO points out that it is not a relief agency, but a permanent organization designed to help prevent the kind of starvation and distress that has always afflicted millions of people, war or no war. Its chief purposes are to raise levels of nutrition and standards of living of the peoples under their

respective jurisdictions, secure improvements in the efficiency of the production of all food and agricultural products, better the condition of rural populations, and contribute toward an expanding world economy. The Interim Commission, with a membership of 49 nations, has made available a preliminary report, "The Work of the FAO," which may be obtained from the U. S. Department of Agriculture, Washington, D. C.

# Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1944-1945\*

THE Committee on Professional Education of the American Public Health Association presents its annual report of Public Health Degrees and Certificates Granted in the Academic Year 1944-1945. As in previous years, this report is prepared from a questionnaire sent to the administrative officers of the schools offering the degrees, the replies to which were subjected only to statistical review. With the exception of public health nursing students, only graduate students enrolled in courses leading to graduate degrees or certificates have been included in the tabulations. Further, the committee is indebted to the National Organization for Public Health Nursing for the preparation of the figures on public health nursing students and degrees, and for permission to include them here.

The data show the schools offering graduate public health degrees, the number of students enrolled in these courses, and the number of students receiving degrees. They do not, however, indicate any implied approval or disapproval either of the individual courses or of the schools, except in the case of programs of study for public health nursing which are approved by the N.O.P.H.N.

The present report is the eleventh

consecutive annual report published by the committee. Although a number of changes have been made in the order and format of tables, they contain the same data as in former years and thus retain their continuity and comparability with other years. McGill University in Canada and Loyola University had temporarily discontinued their graduate public health courses.

The tables suggest a number of comments. The first is that there has been a continuing upward trend in both the number of students enrolled and the number receiving degrees, the low point for public health nursing students having been reached in 1941-1942, and for public health and public health engineering students in 1942-1943. Enrollment of public health and public health engineering graduate students, though nearly one-third less than in 1940-1941, was nevertheless nearly one-fifth more than in 1943-1944. In other words, it appears that wartime deficits in training of personnel are already on the way to being wiped out. However, this may be more apparent than real, since there has been a considerable influx of South American students into schools of public health in the United States in the last several years.

It is further worthy of note that the

\* For previous reports see *A.J.P.H.*, Vol. 34, p. 1264; Vol. 33, p. 1430; Vol. 32, p. 1360; Vol. 31, p. 1306; Vol. 30, p. 1456; Vol. 29, p. 1338; Vol. 28, p. 863; Vol. 27, p. 1267; Vol. 26, p. 819; Vol. 25, p. 341; Vol. 23, p. 1124.

Table 1.—Universities Offering Graduate Degrees in Public Health or Public Health and Sanitary Engineering, Each University, Academic Year, 1944–1945

University	<i>Dr.P.H.</i>	<i>Dr.Engr.</i>	<i>Sc.D.</i>	<i>Sc.D.Hyg.</i>	<i>Ph.D.</i>	<i>Ph.D.P.H.</i>	<i>Ph.D.C.E.</i>	<i>M.P.H.</i>	<i>M.C.E.</i>	<i>M.S.</i>	<i>M.S.P.H.</i>	<i>M.S.P.H.E.</i>	<i>M.S.S.E.</i>	<i>M.S.C.E.</i>	<i>M.S.Hyg.</i>	<i>M.A.</i>	<i>M.A.in Sc.</i>	<i>M.A.C.E.</i>	<i>M.San.Sc.</i>	<i>Engr.C.E.</i>	<i>D.P.H.</i>	<i>C.P.H.</i>	<i>C.M.T.</i>
Total	6	1	2	1	8	2	1	10	3	8	5	1	1	2	1	2	1	1	1	1	1	4	1
Agri. & Mech. College of Texas																							
Columbia University					X					X	X												
Cornell University									X														
Harvard University								X		X													
Iowa State College	X		X		X			X		X													
Johns Hopkins University	X	X		X				X							X								
Mass. Institute of Technology										X													
New York University			X																				
Rutgers University					X					X													
Stanford University							X											X					
State College of Washington																							
University of Alabama								X					X										
University of California	X							X		X												X	
University of Illinois					X					X													
University of Iowa					X								X										
University of Kansas													X										
University of Kentucky																							
University of Michigan	X							X		X	X												
University of Minnesota					X					X												X	
University of North Carolina								X						X									
University of Pennsylvania								X			X												
University of Puerto Rico											X											X	
University of Toronto																			X				
Vanderbilt University					X																		
West Virginia University								X															
Yale University	X																						

\* This school also gives D.D.P.H., D.I.H., and D.V.P.H.

Note: The designations P.H. and E after the name of the University indicate that the school offers degrees in Public Health and Public Health Engineering respectively.

Table 2.—Graduate Students Enrolled in Public Health and Sanitary Engineering Courses, with Professional Background of Public Health Students, Each University, Academic Year, 1944–1945

University	Total	Total	PUBLIC HEALTH										Other	PUBLIC HEALTH ENGINEERING
			Physicians	Dentists	Epidemiologists	Public Health Laboratory Workers	Public Health Engineers	Sanitarians	Statisticians	Public Health Educators	Public Health Nurses	Nutritionists	Teachers	Veterinarians
Total	540	462	161	25	2	50	2	2	6	107	9	7	42	78
Agri. & Mech. College of Texas	4	4	7	1	..	..	1	..	1	..	..	..	..	4
Columbia University	10	10	..	..	..	..	..	..	..	..	..	..	..	4
Cornell University	4	4	..	..	..	4	..	..	1	5	4	..	2	4
Harvard University	58	37 <sup>a</sup>	18	..	..	..	..	..	..	..	..	2	..	21
Iowa State College	..	..	..	..	..	..	..	..	..	..	2	..	..	1
Iowa State College	..	..	..	..	..	5	1	..	1	..	..	..	..	..
Johns Hopkins University	57	56	47	..	..	..	..	..	..	..	..	..	..	7
Mass. Institute of Technology	7	..	..	..	..	..	..	..	..	..	..	..	..	10
New York University	10 <sup>b</sup>	..	..	..	..	..	..	..	..	..	..	..	..	..
Rutgers University	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Stanford University	..	..	..	..	..	..	..	..	..	..	..	..	..	..
State College of Washington	1	1	..	..	..	..	..	..	..	..	..	..	..	1
University of Alabama	1	..	..	..	..	4	..	..	2	..	..	..	..	..
University of California	7	7	1	..	..	..	..	..	..	..	..	..	..	..
University of Illinois	..	..	..	..	..	..	..	..	..	..	..	..	..	..
University of Iowa	..	..	..	..	..	..	..	..	..	..	..	..	..	..
University of Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..
University of Kentucky	1	1	1	..	..	..	..	..	..	..	..	1	..	17
University of Michigan	153	136	30	18	2	3	..	..	1	73	..	1	8	2
University of Minnesota	7	5	..	..	..	..	..	..	..	5	..	..	..	2
University of North Carolina	73	62	2	..	..	4	..	2	..	3	2	1	40	11
University of Pennsylvania	22	22	17	3	..	..	..	..	..	..	..	..	2	..
University of Puerto Rico	36	36	..	..	..	15	..	..	..	..	..	1	..	21 <sup>c</sup>
University of Toronto	53	53	30	3	..	13	..	..	..	..	..	..	..	..
Vanderbilt University	..	..	..	..	..	..	..	..	..	..	..	..	..	..
West Virginia University	..	..	..	..	..	..	..	..	..	21	1	2	2	..
Yale University	36	36	8	..	..	2	..	..	..	..	..	..	..	..

<sup>a</sup> In addition there were 25 part-time students not working for degrees.

<sup>b</sup> Part-time evening students, candidates for graduate degrees.

<sup>c</sup> Candidates for degree of Master of Sanitary Science, professional background not reported.





Table 4.—Summary of Students Receiving and Institutions Offering Graduate Degrees in Public Health and in Public Health and Sanitary Engineering, Academic Year 1944-1945

Degree or Certificate	Students Receiving Degrees			Institutions Offering Degrees	
	Total	Public Health	Public Health Engineering	Public Health	Public Health Engineering
Total	308	270	38	..	..
Doctor of Public Health	8	8	..	6	..
Doctor of Engineering	..	..	..	..	1
Doctor of Science	..	..	..	..	2
Doctor of Science in Hygiene	..	..	..	1	..
Doctor of Philosophy	4	4	..	3	5
Doctor of Philosophy, Public Health	..	..	..	2	..
Doctor of Philosophy, Civil Engineering	..	..	..	..	1
Master of Public Health	140	130	10	9	3
Master of Civil Engineering	1	..	1	..	3
Master of Science	17	..	17	1	7
Master of Science, Public Health	68	59	9	5	1
Master of Science, Public Health Engineering	..	..	..	..	1
Master of Science, Sanitary Engineering	..	..	..	..	4
Master of Science, Civil Engineering	1	..	1	..	2
Master of Science, Hygiene	1	1	..	1	..
Master of Arts	3	3	..	2	..
Master of Arts in Science	..	..	..	..	1
Master of Arts in Civil Engineering	..	..	..	..	1
Master of Sanitary Science	18	18	..	1	..
Engineer in Civil Engineering	..	..	..	..	1
Diploma, Public Health	22	22	..	1	..
Diploma, Dental Public Health	2	2	..	1	..
Diploma, Industrial Hygiene	1	1	..	1	..
Diploma, Veterinary Public Health	6	6	..	1	..
Certificate, Public Health	2	2	..	4	..
Certificate, Medical Technology	14	14	..	1	..

training load is unevenly divided among the 26 universities reportedly offering graduate courses in public health or public health engineering. Although 540 public health and public health engineering graduate students were enrolled in 18 schools, 90 per cent of these were in 8 universities with enrollments varying from 22 to 153. (The 8 are among the 9 members of the Association of Public Health Schools, and 5 grant degrees in both public health and public health engineering.) The remainder were in 10 schools with enrollments of from one to ten students. Eight schools offering degrees had no students in the courses leading to these degrees in the academic year 1944-1945, a reflection in part of military service requirements.

The 8 universities with 90 per cent

of enrollments gave 93 per cent of the degrees granted to 308 students. Only 7 other schools granted degrees to students, ranging in number from 1 to 8. Less than 60 per cent of enrolled students received degrees, a higher percentage than in either 1940-1941 or 1943-1944.

Although the 26 schools offered a total of 26 different degrees, or certificates, ranging from 1 to 8 per school, more than three-fourths of all degrees granted during the academic year were in five categories—Doctor of Public Health, Master of Public Health, Master of Science in Public Health, Diploma in Public Health, and Certificate in Public Health. Five of the separate degrees offered and granted—Master of Sanitary Science, Certificate in Medical Technology, Diploma in

Table 5.—Students Receiving Public Health Nursing Degrees or Certificates, Each of 31 Universities Whose Programs of Study in Public Health Nursing Are Approved by N.O.P.H.N., Academic Year 1944-1945

University	Number of Students Receiving			
	Total	Master's Degree	Baccalaureate Degree	Certificate *
Total	896	32	392	472
Catholic University of America	37	..	18	19
Columbia University	57	11	30	16
Duquesne University	18	..	6	12
George Peabody College for Teachers	66	6	21	39
Incarinate Word College	10	..	2	8
Indiana University	5	..	3	2
Loyola University	33	..	14	19
Marquette University	12	..	2	10
Medical College of Virginia	28	..	..	28
New York University	130	8	69	53
St. John's University	16	..	2	14
St. Louis University	6	..	6	..
Seton Hall College	14	..	3	11
Simmons College		No report received		
Syracuse University	38	..	5	33
University of Buffalo	10	..	7	3
University of California, Berkeley	29	..	17	12
University of California, Los Angeles	22	..	17	5
University of Chicago	6	1	..	5
University of Colorado	11	..	1	10
University of Hawaii	12	..	..	12
University of Michigan	24	2	11	11
University of Minnesota	101	1	77	23
University of North Carolina	23	1	10	12
University of Oregon	18	..	4	14
University of Pennsylvania	48	..	18	30
University of Pittsburgh	3	..	3	..
University of Washington	24	1	9	14
Vanderbilt University	15	..	1	14
Wayne University	31	1	19	11
Western Reserve University	49	..	17	32

\* Includes those students completing approved program of study in schools that do not grant certificates.

Dental Public Health, Diploma in Veterinary Public Health, and Diploma in Industrial Hygiene—are offered by the University of Puerto Rico or the University of Toronto, representing terminology current in these regions. Of the 16 other degrees offered only 6 were granted to 27 students in 8 schools in the last academic year.

The analysis of enrollments in graduate public health courses (excluding engineering and nursing) by professional background of the students also has some noteworthy features. Health educators were nearly one-fourth of total enrollments; only five years ago they were only 11 per

cent of the total. In addition to the growing importance of health education which this undoubtedly reflects, it of course also reflects the drop in enrollment of physicians, engineers, and sanitarians because of the demands for military and other war service. Conversely the proportion of physicians among enrollees has gone steadily down in the last four years; from 51 per cent in 1940-1941 to 33 in 1943-1944. During the last year it rose only slightly to 35 per cent of the total. Public health laboratory workers were 4 per cent of the total five years ago, 15 per cent in 1943-1944, and 11 per cent in the last year under analysis. Dentists,

Table 6.—Enrollment in Graduate Public Health Courses and Students Receiving Graduate Degrees or Certificates, Five Year Summary, 1941-1945

Academic Year	Enrollment <sup>a</sup>			Students Receiving Degrees or Certificates			
	Total	Public Health	Public Health Engineering	Total	Public Health	Public Health Engineering	Public Health Nursing
Total	2,791	2,292	499	5,797	1,237	245	4,315
1940-1941	775	645	130	1,340	332	59	949
1941-1942	629	466	163	1,077	269	89	719
1942-1943	387	323	64	1,057	159	24	874
1943-1944	460	396	64	1,119	207	35	877
1944-1945	540	462	78	1,204	270	38	896

<sup>a</sup> This information is not available for the 31 schools offering approved programs of study for public health nursing.

although numbering only 25 in 1944-1945, nevertheless were a larger proportion of the total than in any one of the last five years.

The National Organization for Public Health Nursing has, since 1920, had a committee accrediting public health nursing graduate studies. This committee, now called the Committee

on Accreditation, surveys for approval graduate programs of study in public health nursing. Nurses who have completed the approved programs of study, consisting usually of one year after completion of R. N. training, and have the accompanying certificates or degrees, generally are given priority in the selection of public health nursing per-

Table 7.—Students Receiving Graduate Degrees or Certificates Summary, 5 Year Period, 1941-1945

Degree or Certificate	Total	1940-41	1941-42	1942-43	1943-44	1944-45
Total	5,797	1,340	1,077	1,057	1,119	1,204
Doctor of Public Health	57	20	12	7	10	8
Doctor of Engineering	5	..	2	1	2	..
Doctor of Science	28	7	17	1	3	..
Doctor of Philosophy	20	2	9	2	3	4
Master of Public Health	631	156	151	83	101	140
Master of Civil Engineering	26	11	6	3	5	1
Master of Science	134	47	28	13	29	17
Master of Science, Public Health	295	90	73	19	45	68
Master of Science, Public Health Engineering	7	..	2	1	4	..
Master of Science, Sanitary Engineering	9	2	4	2	1	..
Master of Science, Civil Engineering	3	..	2	..	..	1
Master of Arts	8	1	1	..	3	3
Master of Arts in Science	4	..	3	1	..	..
Master of Sanitary Science	18	..	..	..	..	18
Master's Degree (Nurses)	182	42	22	43	43	32
Engineer in Civil Engineering	5	3	..	2	..	..
Diploma, Public Health	108	29	19	20	18	22
Diploma, Veterinary Public Health	11	5	..	..	..	6
Baccalaureate Degree (Nurses)	1,695	339	215	388	361	392
Certificate, Public Health	43	18	4	14	5	2
Certificate, Medical Technology	40	..	..	14	12	14
Certificate, Public Health Nursing	2,437	568	482	443	472	472
Other	31	..	25 <sup>a</sup>	..	2 <sup>b</sup>	4 <sup>c</sup>

<sup>a</sup> Includes 24 certificates in Engineering Science and Management Defense Training and one Master of Science in Engineering.

<sup>b</sup> Includes one each of Doctor of Public Health Nursing and Master of Science in Preventive Medicine and Public Health.

<sup>c</sup> Includes one each of Master of Science in Hygiene and Diploma of Industrial Hygiene and two Diplomas in Dental Public Health.

sonnel in those state and local health departments that have merit systems.

Table 5, prepared by the N.O.P.H.N. and used here with its permission, gives the figures for number of students receiving degrees or certificates or completing the program of study in the 31 schools whose programs have been approved by the N.O.P.H.N. Committee on Accreditation.

In the 31 schools, the year's program of study is the major in a degree program, but it may be completed and a certificate granted before all work for a degree is completed. Many of the schools do not grant certificates. Hence, figures in the last column of Table 5

include those students who have completed the approved course of study of one year, whether or not the school grants certificates.

In addition, during the past year the N.O.P.H.N. and the National League for Nursing Education have joined in accrediting the School of Nursing of Skidmore College. This college, which offers a four year basic professional curriculum leading to a degree, prepares its students for staff level positions in public health agencies that provide direct nursing supervision. There were 9 of these graduates in the academic year 1944-1945.

W. P. SHEPARD, M.D., *Chairman*

---

## Dr. Walter Reed Elected to Hall of Fame

The Electors of the Hall of Fame for Great Americans at New York University, New York City, have chosen Dr. Walter Reed of yellow fever fame as one to be included among the statues of persons whose statues will hereafter be in the Hall of Fame.

Other persons elected included Booker T. Washington, Thomas Paine, and Sidney Lanier. These were elected by the College of Electors, comprised

of ninety-three distinguished men and women from all the states. There were 130 candidates nominated by the public.

The selection raises the total chosen for the Hall of Fame since 1900 to 77. Bronze busts of those elected are placed in the colonnade on the University campus. Dr. James Roland Angell, former President of Yale, is Director of the College of Electors.

# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 35

December, 1945

Number 12

C.-E. A. WINSLOW, DR.P.H., *Editor*  
LEONA BAUMGARTNER, M.D., *Associate Editor*  
ARTHUR P. MILLER, C.E., *Associate Editor*

MAZYCK P. RAVENEL, M.D., *Editor Emeritus*  
MARTIN FROBISHER, JR., Sc.D., *Associate Editor*  
JAMES E. PERKINS, M.D., *Associate Editor*  
AUGUSTA JAY, *Editorial Associate*

## *Editorial Board*

REGINALD M. ATWATER, M.D.  
*Chairman, and Managing Editor*  
IRA V. HISCOCK, Sc.D.  
KENNETH F. MAXCY, M.D.  
HENRY E. MELENCEY, M.D.  
ALTON S. POPE, M.D.  
C.-E. A. WINSLOW, DR.P.H.

## THE AMERICAN JOURNAL OF PUBLIC HEALTH

AN article in this issue of the *Journal* commemorates an important event in our history, the completion of the thirty-fifth volume of the *American Journal of Public Health*.

The *Journal* has—in spirit, if not in form—a longer life-story. In 1910, the *American Journal of Public Hygiene*, under the editorship of Boston's veteran health officer, S. H. Durgin (and sponsored by the Massachusetts Association of Boards of Health), published its twentieth volume. At the Milwaukee meeting of the A.P.H.A. a Committee on *Journal* had been appointed under the chairmanship of E. C. Levy, of Richmond, and this committee arranged to take over the Massachusetts *Journal* which in 1911 appeared as the *Journal of the American Public Health Association* under the editorship of B. R. Rickards. In 1912, the present title was adopted.

The first number of the *Journal* for January, 1911, is inspiring in its broad view of the future problems with which our *Association* has been concerned. It contains an article by W. T. Sedgwick "On the Proper Correlation of Physicians, Engineers and other Specialists in Public Health Work"—an analysis of the interrelationships between the various branches of our profession and a plea for sound executive leadership in public health administration. It contains also an article by Frederic Almy on "The Inter-Relation of National Organizations Working in the Interest of Public Health," a consideration of just those relationships between public health and the broader fields of social work, which we are discussing with reference to the Gunn-Platt report today. In more technical fields, it contains papers on terminal disinfection by C. V. Chapin, on a "score system" for determining the relative importance of various infectious diseases by H. W. Hill, and on birth registration and infant mortality by J. H. Mason Knox.

The pioneers of 1911 blazed a clear trail; and during the 35 years which have passed, that trail has been followed under the leadership of Farrand and Vaughan and Ravenel and Mustard.

An *Association* such as ours does not exist primarily for the pleasures of mutual contact or for the protection of the interests of its members. Its most

important rôle is the promotion of constructive collective thinking; and the *Journal* is the medium of expression for our common mind. Emphasis may change from time to time. The 1911 founders included in their vision of the *Journal's* activities popular health instruction; but that function is now performed through other media. In the main, the *Journal*, through all the years, has devoted itself primarily to the discussion and to the dissemination among its members of the latest knowledge of the complex and manifold techniques of public health, in preventive medicine, epidemiology, sanitation, public health practice and social relationships. This is, and should be, its major function. In view of the growing diversification of the public health field, we are now supplementing specialized technical articles by occasional broader reviews, interpreting new and important fields to other groups of our membership.

The present Editorial Board will continue its efforts to follow and improve upon the distinguished achievements of the past. Its success will depend upon you. The Levy Committee said, "The fate of the *Journal* must rest largely with the rank and file of the members of the A.P.H.A." This is as true in 1945 as it was in 1911.

## CALIFORNIA'S ANNIVERSARY

IN this *Journal* for December, 1944, we have chronicled the 75th Anniversary of the establishment in Massachusetts of the first State Board of Health in the United States. We cannot let the year pass without paying tribute to California which followed promptly "in the footsteps of the most enlightened commonwealth in America" and which also celebrates this year a seventy-fifth birthday.

The California State Board of Health was created by law on April 15, 1870, and held its first meeting on April 22, at which time Dr. Thomas M. Logan was elected "permanent Secretary." Dr. Logan was one of the outstanding pioneers of public health in the United States with a vision for which he fought with courage and eloquence at the meetings of the A.M.A. and in the legislative councils of his own state. At the meeting on April 22, 1870, he pointed out that

"When people shall be made to understand the economic and political importance of public health and salubrity, shall our efforts be appreciated, and the wholesome lessons of domestic and civil hygiene, emanating from us, shall be respected as the rules and defences for the person, the domicile, the municipality, and the State.

"According to my construction of the late sanitary legislation respecting a State Board of Health and Vital Statistics, etc., its members are to look after the vital interests and physical condition of the people, just as the boards of education and agriculture look after and promote the intellectual and productive powers intrusted to them. Like these boards, so successful and useful in their administration, ours, in pursuit of its purpose, is to find its own way of usefulness and lay its own plans of operation. We are to endeavor to create an interest in our work among the lay as well as the professional public, and to raise up friends in all parts of the State to cooperate with us in our investigations in gathering sanitary information and in spreading it again abroad. We are to encourage the formation of local boards of health, the registration of births and deaths and marriages, whereby mortality and other reports touching the vital conditions of the people may be obtained monthly, and if possible, weekly. In such reports we will find the first indications of the vital condition of the various parts of the State—the drift of all epidemic influences and the dangers that may be impending."<sup>1</sup>

Logan's emphasis on the importance of statistical controls and the necessity

for enlisting public support through community education was particularly significant and far-sighted; and the first Annual Report of the new Board laid special emphasis on the following nine points as questions "which are pressing most grievously on every class of society."

1. The use of intoxicating liquors
2. Ventilation
3. School room disease
4. Female hygiene
5. Municipal regulations concerning the dead
6. The supply of water to our cities and towns, for sewage as well as domestic supply
7. The sanitary architecture of our public buildings
8. The Chinese from a sanitary standpoint
9. The social evil problem

The California State Board of Health had its ups and down, like all other organizations which depend upon fallible human nature for their operation. The first ten or fifteen years of its history made contributions of national significance. After that, no more Logans appeared on the horizon for a time.

In 1903, after the unfortunate controversy about bubonic plague in San Francisco,<sup>2</sup> the State Board of Health was reorganized under the secretaryship of Dr. N. K. Foster who was succeeded in 1909 by Dr. W. F. Snow, followed by Dr. W. A. Sawyer in 1915. Under these brilliant young leaders, the California Board of Health again attained a position of continental influence. In this phase of its history, outstanding progress was made in sanitation, control of water supplies and sewage disposal; in malaria control; in tuberculosis control; in venereal disease control; and in health education.

In 1943 the service was again fundamentally reorganized and Dr. W. L. Halverson was appointed Director of what was now the State Department of Public Health. Dr. Snow, whose unique contribution to the Department in earlier days entitles him to speak with authority, has said, in personal correspondence with the Editor: "Now, with Dr. Halverson it is thoroughly launched again on what I believe is the most important period of its long and interesting story. We may confidently count on California to be in the top bracket of our states in the pioneering and permanent progress of Public Health and Medicine of the future."

As a famous orator once said of Massachusetts, "There she stands," and California stands at her side.

#### REFERENCES

1. *California's Health*, 2:141, Mar. 31, 1945. State Department of Public Health, Sacramento.
2. In 1941, a student at the University of California submitted, as an essay in a course in public health, a thesis attempting to prove that the disease in question in 1902 was *not* bubonic plague. Old errors die hard.

## MARRIAGE BELLS IN SEATTLE

FOR many years it has been recognized that a single generalized public health nursing service is the ultimate ideal at which we should aim in any community. Rarely, now, do we find six or seven different public health nurses from different agencies visiting a home—as was not uncommon twenty years ago. Many cities, however, still have three staffs of nurses, representing the health department, the board of education and the V.N.A.; and the gap between official and voluntary nursing agencies has been particularly difficult to bridge.



In many communities, the health department has contracted with the V.N.A. to perform certain routine duties (tuberculosis nursing in New Haven, Conn., for example); in some cities (Dayton, Ohio, Columbus, Ohio, Oakland, Calif.), the health department and the V.N.A. have formed a joint nursing staff under a single director; in some (New Orleans, La.), the health department has taken over the fundamental bedside provision of bedside care in the home.

Seattle has now come to the front with a formula which has originality and promise. In 1943, this city had 34 nurses in the Health Department, 20 in the Seattle Visiting Nurse Service, and 23 under the Board of Education. Early in 1944, an agreement was reached by which the first two of these nursing staffs have been completely and effectively amalgamated.

The Community Fund was at first desirous of reducing its budget by merely turning over certain V.N.A. functions to the city; but the City Council refused to assume further financial responsibilities. For this, Dr. R. T. Westman, Acting Commissioner of Health, and Marguerite Prindiville, Director of the Seattle Visiting Nurse Service<sup>1</sup> say they will "always be thankful." They add "We are now convinced that it is exceedingly important in such a program that the private agency continue to maintain its identity and contribute substantially with funds in order to insure continued high standards of program, freedom from partisan politics, greater flexibility of operation and adequate community support and participation."

The first step taken to effectuate a merger on truly coöperative lines was the adoption of a city ordinance creating a Division of Public Health Nursing in the Health Department; providing that the work of this division should include provision of bedside care and that such bedside service could be extended (with the approval of the County Health Officer) to certain areas outside the municipal limits but now served by the S.V.N.S.; and setting up a "Special Nursing Fund" to include contributions from the Community Fund and fees paid for service. The latter is a new and promising administrative device.

The second step was the signing of an agreement between the Health Department and the S.V.N.S. "creating a Division of Public Health Nursing by Amalgamation," an agreement not legally binding and subject to modification by mutual consent or to termination on the initiative of either party. Its ultimate objective is "a completely generalized service, with each nurse assigned to a district, in which she will assume the responsibility for home visiting for every service."

Under this agreement, the Director of the S.V.N.S. becomes the Director of the Division of Public Nursing in the Health Department. Each nurse (an important point, psychologically) wears a standard uniform displaying a tape reading "Seattle Department of Health" and a pin bearing the words "Seattle V.N.S." The budget for the Division of Public Health Nursing will be prepared by the Commissioner of Health, reviewed by the V.N.S. Board, and approved by the Community Fund. The share of the total budget allotted to the Fund will be paid monthly into the Special Nursing Fund of the Health Department.

The Board of Directors of the S.V.N.S. continues as a self-perpetuating body and acts as an Advisory Board of the Division of Public Health Nursing, subject, of course, to final decisions of the Commissioner of Health. The Board continues to make contracts with industries, insurance companies, etc. Its 400 volunteer workers, organized in districts throughout the city, have continued their

activities under the new program; and the V.N.S. has carried out a vigorous campaign of community education in regard to its significance and potentialities.

Obviously, the success of such a plan depends on statesmanship and good mental hygiene. It will not work with a health officer who is a petty bureaucrat or a nurse director who cultivates defense reactions. It seems, after a year, to work admirably in Seattle. In the article cited above, Dr. Westman and Miss Prindiville jointly state that

"The merger has given more to the community than can be measured by statistics alone. It was like a marriage which brought new blood into the family or like a transfusion which put more life into the body. The merger is the most important thing that has happened to public health in Seattle during the last 25 years, and its results will reach far into the future. It has taken the health department out of the doldrums where it had been a long time and has given it more enthusiasm and vigor, and has set up higher standards of performance. This merger has done more to modernize the health department than any other factor. Both the private and official agencies are exceedingly well pleased with the results. An opportunity has finally been given for the citizens to participate in a total health program with a common goal regardless of source of funds."

The Seattle plan is not a complete novelty. Dayton and Columbus, Ohio, have operated programs of essentially similar nature for nearly a quarter of a century. They work under an unwritten gentlemen's agreement: but they provide a single generalized reasonably complete service under the direction of the Health Officer while maintaining the V.N.A. Board in full activity, with pooling of public and private funds. Jane L. Tuttle, Director of the Columbus Instructive District Nursing Association since the plan was inaugurated in 1922, and Dr. N. C. Dysart, the present Health Commissioner, report the program a complete success. Seattle has presented us with an inspiring challenge for progress along similar lines and has devised new and ingenious administrative machinery for meeting this challenge. The health officers of many communities could study this program (and those of Dayton and Columbus) with advantage.

#### REFERENCE

1. Westman, R. T., and Prindiville, M. The Seattle Nursing Merger. *Pub. Health Nurs.*, 37:294 (June), 1945.

### THE 1944 RECORD

THE Bureau of the Census has released figures showing a 1944 death rate from all causes of 10.4 (excluding the Armed Forces overseas), precisely the same figure as the average for 1939-1941. Significant decreases are noted for nephritis (69.2 as compared with 79.8 for 1939-1941); for motor vehicle accidents (18.3 as compared with 27.0 for 1939-1941); for pneumonia and influenza (61.7 as compared with 69.9 for 1939-1941); and tuberculosis. In spite of dire predictions, the 1939-1941 tuberculosis rate of 45.8 fell to 43.1 in 1942, to 42.6 in 1943, and to 41.3 in 1944. This is the lowest figure ever reported for the United States.

An increase occurred in accidents other than motor vehicle accidents, (from 46.5 in 1939-1941 to 53.5 in 1944), largely as a result of airplane accidents in combat training.

The maladies associated with later life showed notable increases. Diseases of the heart went up from a mortality of 285.9 for 1939-1941 to 315.4 for 1944; that from intracranial lesions of vascular origin rose from 89.2 in 1939-1941 to

93.7 for 1944; that from cancer rose from 119.3 for 1939-1941 to 129.1 for 1944. The higher mean age of the population due to the removal of young adults for overseas service is not sufficient to account for these changes. The captains of the hosts of death remain in the same order: 1. Diseases of the Heart; 2. Cancer and other Malignant Tumors; 3. Intracranial Lesions of Vascular Origin; 4. Nephritis; 5. Pneumonia; 6. Accidents other than motor-vehicle accidents; 7. Tuberculosis.

---

## Best Sellers in the Book Service for November

Local Health Units for the Nation. Haven Emerson, M.D. 1945.....	\$1.25
An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. American Public Health Association. 1945.....	1.00
The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945 . . . . .	.35
Voluntary Health Agencies. An Interpretive Study. Selskar M. Gunn and Philip S. Platt, Ph.D., 1945 . . . . .	3.00
Diagnostic Procedures and Reagents. American Public Health Association. 2nd ed., 1945 . . . . .	4.00
Standard Methods for the Examination of Dairy Products. 8th ed. (1941).....	3.00
Ways to Community Health Education. Ira V. Hiscock, Sc.D.....	3.00
Municipal and Rural Sanitation. Ehlers and Steel, 1943.....	4.00
An Introduction to Public Health. Harry S. Mustard, M.D., 1944.....	3.50

Order from the Book Service  
AMERICAN PUBLIC HEALTH ASSOCIATION

## BOOKS AND REPORTS

*All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.  
All books reviewed in these columns may be purchased through the Book Service.*

**The Bacterial Cell**—By René J. Dubos. Cambridge, Mass.: Harvard University Press, 1945. 460 pp. Price, \$5.00.

The science of bacteriology is comparatively young, and has only recently, in historical terms, begun to emerge from its first decades of primarily descriptive researches into the fields of structural and functional analysis. These investigations have led to contacts between bacteriology, on one hand, and a wide range of branches of physics, chemistry, and biology, on the other. A number of these special applications of chemistry and physics are themselves very young indeed: protein—and nucleic acid—chemistry, electrophoresis, ultracentrifugation and electron microscopy. The evaluation of the applications of these specialized sciences to bacteriology is, therefore, in the current state of development of these researches, particularly difficult for the critical reviewer and particularly valuable for the worker in the field.

Such a contribution to bacteriology and to investigators in bacteriology and immunology has been made by Professor René J. Dubos of the Harvard Medical School and Rockefeller Institute in his recent book. The volume reviews investigations in all relevant fields directed at the nature of the bacterial cell itself, its cytology, structure, physicochemical properties and variation, and at the relation of bacteria to their environment: virulence immunity and immunization, and bacteriostatic and bacteriocidal agents.

But the greatest contribution of Dr. Dubos to the rapidly expanding field

of bacteriology is the attitude in which the book is written. The approach is dynamic and analytic throughout; this is particularly valuable in view of the long-term transition from primarily descriptive research in bacteriology.

Perhaps the best major example of a contribution afforded by this dynamic approach is found in the chapter on staining properties, where the mechanisms involved in staining reactions are discussed in chemical and physicochemical terms. An outstanding example of the analytic attitude and method is found in the discussion of virulence. This property, which is too often considered an attribute of an organism *per se* on intuitive and rather vague grounds, is broken down into such component properties as toxigenicity, invasiveness, communicability, and resistance to the defense mechanisms of the host. Each of these in turn is analyzed and its mechanisms discussed. These examples characterize the treatment of the entire subject and should serve to indicate the peculiar value of this monograph to investigators and students of bacteriology.

T. N. HARRIS

**How a Baby Grows**—By Arnold Gesell, M.D. New York: Harper, 1945. 78 pp. Price, \$2.00.

There will be lively interest in this book for mothers like the reviewer, not only for the facts about babies' growth, but for the manner of presentation. With some 800 photographs and limited text, Dr. Gesell of the Yale Clinic of Child Development describes the expansion of a baby's physical

control and social interests, considering mainly the first year of life. There are references to the further development of some faculties, such as the ability to draw, and some of the pictures carry the study up to five years.

The illustrations have been taken mostly from moving pictures (The Yale Films of Child Development), so that many are in series; we watch the child learn to reach for a block and pick it up, or turn himself and crawl toward a ball, noting the physical and emotional angles of each effort.

One most interesting page shows the locomotive powers of five children, all at the same age, and each quite different. It goes a step beyond the "don't worry if your baby and his cousin learn at different rates" advice found in every baby book, to show that there are several possible means of accomplishing the same result.

This is a book intended to reveal interesting facts about the growth of a small baby; it has fascination for all who are interested in babies. It does not pretend to tell everything there is to know, but it does present through pictures a unique means of better understanding of children. Excellent for the reading table in the health center.

CAROLINE LEONARD

**Health Text-Workbook, An Orientation Course in Personal, Racial, Home and Community Hygiene—***By Kathleen Wilkinson Wootten. (4th ed. rev.) New York: A. S. Barnes, 1944. 212 pp. Price, \$1.50.*

This text-workbook was developed over a period of years for use of college freshmen in an orientation credit course in health. Various phases of personal, home, community, and racial hygiene are taken up. The health material is divided into 47 chapters, each one outlined as to objectives, study outline, activities, references and illustrative material. Although the material from

several chapters may be closely related, there are no overall groupings according to broad subjects. Some topics seem to be treated very briefly, as, for example, the chapter on Food, Nutrition and Weight.

The bibliography is extensive and carefully selected. The introduction contains helpful suggestions as to the use of the text-workbook in making the health course of greatest value to each student.

The small print, and some of the drawings made on a small scale, in the reviewer's opinion, detract from the usefulness of the book.

VIVIAN V. DRENCKHAHN

**Industrial Health Engineering in the Tunneling Operations of the Tennessee Valley Authority—***By Frank N. Chirico, M.S. Chattanooga: T.V.A., 1945. 135 pp. Free from publisher.*

The chief environmental hazards of concern in tunneling were exposures to silica dust, blasting gases, exhaust gases, smoke from Diesel and gasoline operated engines, and undesirable conditions producing fatigue, such as improper lighting, excessive noise, high temperature, and humidity. During the driving of power, diversion, and spillway tunnels, the overall dust concentrations averaging less than 50 per cent free silica were maintained below 10 million particles per cubic foot of air (mppcf). With dust containing as much as 70 per cent free silica, average dust concentrations were maintained below 8.5 mppcf. Positive ventilation rates of 12,000, 21,000, and 25,000 cubic feet of air per minute (cfm) employed in the described tunnels with respective diameters of 16, 20, and 37 feet were adequate when accompanied by proper use of the ventilation equipment and auxiliary control using air-water blast.

The recommended practices for

using Diesel and gasoline operated equipment underground included equipping shovels with gas scrubbers and maintaining the scrubbers in efficient working order, burning high grade fuel containing less than 0.5 per cent sulfur, extending the engine exhaust pipes high above the operator's cab, maintaining the engines in good repair, and discouraging the use of equipment that was old or smoked excessively. The ventilation rate of 25,000 cfm in the 37 ft. diameter tunnels sufficiently reduced the carbon monoxide and nitrogen oxide concentrations below their maximum allowable limit of 100 p.p.m. and 25 p.p.m., respectively. However, this ventilation rate was not sufficient to maintain a clear tunnel so that objectionable gases and smoke would not be irritating to the eyes and would not impair the visibility. It was recommended that the ventilation rate be increased to 30,000 or 35,000 cfm.

Good lighting and reduction of noise were obtained by spacing 50 watt bulbs not more than 25 ft. apart through the length of the tunnel and locating silencers every 1,500 ft. along the ventilation lines. LUCIAN E. RENES

**The Health Instruction Yearbook 1945**—*Compiled by Oliver E. Byrd, Ed.D. Stanford, Calif.: Stanford University Press, 1945. 344 pp. Price, \$3.00.*

Don't mis-read the title and expect to find in this *Yearbook* a manual of health education. What it does offer is content and implementation for health instruction digested from current articles in public health and scientific journals. For instance, of the 316 references in the bibliography, 58 bear the A.M.A. *Journal* "tag" and 17 are from the A.P.H.A. *Journal*.

First published in 1943, the *Yearbook* seeks to keep abreast of the rapidly changing developments and problems in public health, medicine and

allied areas, and succeeds very well indeed. It is intended primarily for school health educators, nurses, public health educators, students and interested laymen.

For those unfamiliar with this *Yearbook* the following sampling of 10 of the 20 chapter titles will indicate the range of its subject matter: Health as a Social Problem, Excretion and Health, Fatigue and Rest, Mental Health and Disease, Infection and Immunity, Habit-Forming Substances, Health Services and Facilities, Family Health, Community Health Service, and Trends and Probabilities.

ROBERT W. OSBORN

**Food for the World**—*Edited by Theodore W. Schultz. Chicago: University of Chicago Press, 1945. 353 pp. Price, \$3.75.*

Unlike some discussions of food problems that took place in the midst of the war, the program of the Twentieth Institute of the Norman Wait Harris Memorial Foundation, held at the University of Chicago in September, 1944, was concerned with the long-time aspects of food in international relations. Consequently the 23 papers and related discussion that constitute in effect the proceedings of the Institute as brought together by Professor Schultz are not "dated" now that the war is over. On the contrary, the book makes especially timely reading in connection with the swinging into action of the United Nations Food and Agriculture Organization. The scope of the discussion is indicated by the titles of the several sections: The Food Movement, Population, Nutrition, Food Supplies, International Relations, and Consequences and Policy.

It is perhaps unfortunate that a great majority of the authors and discussants on this international symposium are from this country. However, most of them have been associated with inter-

national activities in the fields covered by the program, and one has only to read the transcript of any of the discussions to realize that the points of view of the participants are individual rather than nationalistic. Although opinions clash on many points, there is no challenge of the fundamental statement from the United Nations Conference on Food and Agriculture that "the first cause of hunger and malnutrition is poverty."

Specialists in many fields will value the book for its competent treatment of the subjects of their immediate concern. The general reader will find his reward in brilliant presentations of broad policy. MARJORIE M. HESELTINE

**The Doctor's Job—By Carl Binger, M.D.** *New York: Norton, 1945. 243 pp. Price, \$3.00.*

The market has been flooded recently with books by doctors; but this is something different. Dr. Binger does not provide us with gossip about his own personal life; nor does he write about politics or philosophy or economics. He writes about medicine. And he does it in a way which is in the tradition of great physicians, from Hippocrates to Osler. He discusses many of the major problems which confront the individual physician in the practice of his profession; and he does it in such a way that physician, as well as patient, may understand better what the "doctor's job" is and how he gets that job done. The book is revealing as to the way in which a physician approaches diagnosis and treatment of the whole man—and not the symptoms of a disease.

There are two major threads which run through this book. The first of these is the importance of psychosomatic medicine, in regard to which Dr. Binger cites numerous clinical cases which are illuminating as to the subtlety and complexity of human personality. A second emphasis is on the

responsibility of the physician for meeting proposed changes in the social relationships of the profession to the community which it serves. There are individual conclusions with which not all of us may fully agree; but the spirit in which every problem is approached is transcendently honest and fair and reasonable—wise, and understanding, and humane.

This is a book on medicine, not philosophy. But like any sincere exposition of the aims of a human life, it contains the germs of a philosophy. Dr. Binger's approach may be best summarized in two sentences on the last page of the volume: "Perhaps the world will be a better place some day, but it will be better not only for a television set in every home and for the new use of plastics. It will be better when man looks more deeply into himself and accepts responsibility for the bad as well as the good that is in him, using this crude material to mold himself and to shape and reshape his destiny." C.-E. A. WINSLOW

**Psychiatry in Modern Warfare—By Edward A. Strecker, A.M., M.D., Litt.D., LL.D., and Kenneth E. Appel, Ph.D., M.D., Sc.D.** *New York: Macmillan, 1945. 88 pp. Price, \$1.50.*

Two eminent psychiatrists have condensed a vast fund of information into this well documented and well written little book.

In Part I, which is entitled Psychiatry and the Two World Wars, the authors contrast the nature of warfare in the two wars and evaluate their potentialities as a cause of emotional disturbance both among civilians and the armed forces. Comparative statistics of neuropsychiatric disturbances in the two wars and in the general population are given. While World War II has not produced any new psychiatric entities (with one possible exception) the authors state that

symptomatology is preponderantly different, indicating that probably deeper emotional recesses have been penetrated. Methods of treatment for these conditions are outlined, and general prognoses given. Comments as to the place of psychiatry in the military organization are pertinent, as well as the use of psychiatric man power.

Part II, Demobilization and the Return to Civilian Life, gives us some idea of the change in attitude, orientation, and behavior demanded of the military man when he returns home. Methods of helping the ex-service man are briefly touched upon and a plea is made for improved veteran facilities.

The extensive bibliography is a valuable part of the book. This book will be of use to those interested in what the veteran's experiences have meant to him in terms of his adjustment to civilian life, as well as to physicians, public health nurses, social workers, and personnel workers who are concerned with the maintaining of mental health.

HESTER B. CRUTCHER

**Solving Camp Behavior Problems**  
—By J. Kenneth Doherty. New York: Association Press, Y.M.C.A., 1944. 62 pp. Price, \$.50.

The author of this unique booklet has had considerable experience with camping problems as chairman of the Committee on Education, University of Michigan Fresh Air Camp, and former Director of Camp Mississauga. He has drawn substantially from the publications of the National Committee for Mental Hygiene and studies carried on through research in child development at the University of Michigan Elementary School. The method of presentation is uniquely his own.

Each chapter categorically takes up some familiar problem of camp life relating to children, states the problem clearly, and then offers possible solu-

tions in a series of brief, to the point, practical paragraphs based largely upon modern methods of mental hygiene.

A select bibliography, valuable for camp situations, is appended. This should prove helpful to camp counselors, especially to those new in the field.

RICHARD A. BOLT

**Public Medical Care**—By Franz Goldmann, M.D. New York: Columbia University Press, 1945. 226 pp. Price, \$2.75.

This book deals with public medical care as a social movement. The first part interprets, analyzes, and appraises public policy in providing, at public expense, facilities and services for the care of the sick.

The second part deals with the problems of planning for medical care facilities, professional services, financing, and administration. It attempts to point out the relative merits of taxation and insurance and their potential value to the development of future broad health programs. A very inclusive index and a list of references are appended.

This book is a masterful marshaling of material and is highly stimulating. It is a textbook, fair and accurate in presentation and vivid in style. It should be required reading for all medical students, internes, residents and practising physicians. It is highly recommended to public health officers, hospital administrators and their trustees, and those interested in social security legislation.

The emphasis placed upon democratic concepts, the advantages of medical group practice, and the obvious tendency toward the development of health insurance schemes of various types deserve high praise.

Two very minor points may be raised: The terms "group clinic" and "out-patient department" should be further clarified. Also, Dr. Goldmann is lenient in his treatment of the attitude of reac-



tionary medical men toward the development of medical group practice units. The document which is quoted on page 66 is a white-washing job which the American Medical Association did on itself and does not deserve the dignity of repetition.

KINGSLEY ROBERTS

**Woman's Medical Problems—***By Maxine Davis. New York: McGraw-Hill, 1945. 220 pp. Price, \$2.00.*

This is a reasonable and useful presentation, written in the kind of English a doctor can seldom bring himself to employ. Here, the statisticular is turned into the vernacular. Of the 209 pages of text, one-half are devoted to menstruation, pregnancy, and childbirth, a fourth to disorders and tumors, and one-eighth to cancer. One-eighth is also given to contraception—the "rhythm" being treated rather fully. The final section takes up Women at Work.

The three very high authorities to whom acknowledgment is made should have outlawed the few spotty recommendations and statements, such as waiting until eighteen years of age before investigating a delayed menstrual start; the sweeping denouncement of hormone treatment; frequent pregnancy not usually ruining health; the use of stems for labor injuries, and the data on conception control not up-to-date. There is much shrewd counsel, as in selection of one's obstetrician by finding who, in a given community, delivers the doctors' wives, and in specifying carefully the need of exact and early diagnosis, and skilled care.

ROBERT L. DICKINSON

**Marriage and Family Counseling—***By Sidney E. Goldstein. New York: McGraw-Hill, 1945. 457 pp. Price, \$3.50.*

In the present 457 pages dealing with

an interprofessional field of much public concern, we find rather more than a representative contemporary pattern of social ills and suggested remedies.

Of the five categories of problems dealt with, the legal, economic and the ethical are handled with more responsibility than are the medical, or the biological and psychological, as the author describes them.

The marriage counsellor may achieve his or her ambition to create a new profession. However, one cannot accept this volume as a model for professional use.

There is an excess of words and of repetition of commonplace attitudes and comments and there is a dearth of critical and constructive analysis of the bases of human relations.

The decidedly dull text is divided into three Parts and within these are sixteen chapters, besides a long introduction and a useful appendix and index.

Part I deals with the pre-marital conference in 160 pages; Part II discusses Family Counseling; Part III tells of Counseling in Practice as the undertaking of a Consultation Center.

The book shows a serious and methodical attempt to tell the experiences and social ideas of the author.

He belongs to the school that considers that there is no personal responsibility for poverty, crime, or distress, but that the primary fault is that of society, to be corrected by passing laws to alter the social and economic pattern. He emphasizes the weaknesses, defects, impairments and disturbances in the psycho-physical constitutions of men and women as being the cause of most marital maladjustments and tends to exonerate the individuals involved. Few physicians, health officers, or nurses will find much inspiration in this text.

HAVEN EMERSON

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Convergent vs. Differential—**It seems there are two ways to go about the study of diseases: one is to investigate differences in clinical manifestations; the other is to delve epidemiologically into the divergent causes which may produce the same lesion. This paper, which is concerned with the latter method, is one that requires iron concentration every inch of the way. If you're given to wool-gathering when you read, pass this one up.

AYCOCK, W. L., and FOLEY, G. F. An Epidemiologic Approach to the Study of the Biochemical Mechanism of Motor Neuron Disease—Landry's Paralysis. *Am. J. M. Sc.* 210, 3:397 (Sept.), 1945.

**Swansea Rehouses—**Any account of what England is being forced to do to rehouse its homeless should prove of interest to us of this lucky land in which, because we were spared the blitz, our poor have the continuing privilege of living in our still standing slums—and, the way things seem to be going, they will enjoy that privilege for a long while.

BENNETT, J. B. Reconstruction and Housing Problems of Swansea. *J. Roy. San. Inst.* 65, 4:233 (Oct.), 1945.

**About the Book "Voluntary Health Agencies"—**Seven top-notch stories interpret the interpretative report of the Gunn-Platt Survey of voluntary health agencies. Current annual public donations amount to \$94 per case of poliomyelitis, \$22 per case of tuberculosis, \$8 per case of cancer, and \$.03 per case of heart disease. Perhaps you will feel impelled to add a little interpretation of your own.

BRADLEY, B. From Yesterday to Tomorrow (and six related papers). *Survey.* 81, 10:253 (Oct.), 1945.

**Living on a Volcano—**This account of the unusual difficulties which the Seabees overcame in providing an adequate water supply on volcanic, sulfurous Iwo Jima will entertain you even though your only professional connection with the municipal water system is the laboratory sink faucet.

DAY, R. P. "Wildcatting" Water Wells on Iwo Jima. *Water Works Eng.* 98, 19:1102 (Sept. 19), 1945.

**Persuading Them to Like Spinach—**Public health nurses conducted a demonstration of nutritional teaching among sixty Upper Harlem families in 1943. A before-and-after comparison of consumption of vegetables, among other essential foods, suggests that "selective" teaching produces results.

DOWNES, J., and BARANOVSKY, A. An Experiment in Nutrition Teaching by Public Health Nurses. *Milbank Quart.* 23, 3:227 (July), 1945.

**Tough N—**One section of Baltimore had an outbreak of diphtheria in 1944 with an unusual number of deaths and cases of bull-neck. Almost none of the infected children had had tonsillectomies, and 63 per cent had had a history of prior toxoid inoculation. There was no "gravis" strain.

ELLER, C. H., and FROBISHER, M., JR. An Outbreak of Diphtheria in Baltimore in 1944. *Am. J. Hyg.* 42, 2:179 (Sept.), 1945.

**Promin for Leprosy—**No claim is made in this paper that promin is a specific remedy for leprosy, but evidence is offered that suggests it to be the treatment of choice, for it is the best treatment ever tested at the National Leprosarium.

FAGET, G. H., and POGGE, R. C. The Therapeutic Effect of Promin in Leprosy. *Pub. Health Rep.* 60, 40:1165 (Oct. 5), 1945.

**In Praise of Exhibits**—Myself an "armchair health educator," a scribbler of tracts, I grieve that the health booklet must be condemned to outer darkness just to build a better case for other tools of health education. To make his point about the superiority of exhibits, the author writes a brochure in which he names a particularly useful manual. So it would seem that the pamphleteer's ancient medium must have some continuing value.

GEBHARD, B. Visual Communication in Health Education. *Pub. Health Nurs.* 37, 10:506 (Oct.), 1945.

"There but for the Grace of God . . ."—In Halifax, which has suffered for some years from a visitation of malignant diphtheria, Schick-negative and immunized children continue to come down with the disease. It can be said that the incidence among Schick-negative children was only a tenth of that of the unprotected population.

GIBBONS, R. J. Diphtheria among Schick-Negative Persons in Halifax, Nova Scotia. *Canad. Pub. Health J.* 36, 9:341 (Sept.), 1945.

**Potentiometers, Spectrophotometers, *et al.***—Expounded here is the thesis that the current trend in water laboratory practice is from chemical to physical methods of analysis. The analysts, I assume, know this already; the gist of the discussion should be made known to administrators, and others interested in community sanitation.

GRAHAM, D. W. Trends in Water Laboratory Practice. *J. Am. Water Works A.* 37, 10:985 (Oct.), 1945.

**Experimental Polio**—Here are some suggestive findings: monkeys subjected to exhaustive exercise and chilling during the incubation period of experimental poliomyelitis developed a higher incidence and more severe paralysis than controls. Incidence and severity of

paralysis were significantly greater in summer inoculations.

LEVINSON, S. O., MILLER, A., and LEWIN, P. Effect of Fatigue, Chilling and Mechanical Trauma on Resistance to Experimental Poliomyelitis. *Am. J. Hyg.* 42, 2:204 (Sept.), 1945.

**How Death Comes to Old Ontarians**—Although mortality among people aged 50 and over in Ontario has not declined during this century, there have been striking drops in deaths from certain causes. Despite the savings from tuberculosis, typhoid fever, respiratory diseases, appendicitis, and peritonitis, the total rates do not go down because of accidents and—as you'd expect—cancer and circulatory diseases.

McKINNON, N. E. Mortality Reductions in Ontario, 1900-1942. *Canad. Pub. Health J.* 36, 9:368 (Sept.), 1945.

**"Every School Has Health Policies"**—A distinguished committee offers a guide for all concerned with health in schools, mentioning among those to whom it is particularly addressed, boards of education and health, school and community health administrators and their staffs, social workers, parents and professional students. That apparently includes almost everybody, and rightly so.

NATIONAL COMMITTEE ON SCHOOL HEALTH POLICIES. Suggested School Health Policies. *J. School Health.* 45, 8:184 (Oct.), 1945.

**Which Do You Put First?**—Says this writer: infant mortality (in England) may be cut down by seven factors: better housing, higher economic standards, more breast feeding, improved neo-natal care, higher standards of pediatric education, better trained public health nurses, and improved hospital care of infants. It would be interesting to compare this order of importance with American opinion.

NEWNS, G. H. The Problem of Infant

Mortality. J. Roy. Inst. Pub. Health & Hyg. 8, 9:225 (Sept.), 1945.

**Hypothetical Preventive Medicine**  
—If you missed this one in August, as I did, then you most certainly should not fail to read it now. It is a schematization of practical preventive measures that might be organized on a group basis, which would cost about \$5.40 per head.

ROEMER, M. I. A Program of Preventive Medicine for the Individual. Milbank Quart. 23, 3:209 (July), 1945.

**The Quick and the Dead**—One finding of this comparison of inhalator vs. Schafer methods of resuscitation needs quotation here. "No instance of

revival was reported in which more than fifteen minutes elapsed between the cessation of breathing and the start of artificial respiration."

ROSS, B. D. Five Year Survey of Methods for Artificial Respiration. J.A.M.A. 129, 6:443 (Oct. 6), 1945.

**Let's Have More of This**—Given as a part of an in-service training course for physicians and public health nurses, this discussion of infant feeding, weaning, thumb-sucking, toilet training, anxieties and jealousies is just what you need for your own in-service training whatever your job may be.

SPOCK, B. Avoiding Behavior Problems. J. Pediat. 27, 4:363 (Oct.), 1945.

## BOOKS RECEIVED

*Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.*

**AN EXPERIMENT IN THE PSYCHIATRIC TREATMENT OF PROMISCUOUS GIRLS.** A psychiatric Study Under the Auspices of the Venereal Disease Division of the U. S. Public Health Service, the California State Department of Public Health and the San Francisco Department of Public Health, January 1943 to June 1944. By Ernest G. Lyon, M.D., Helen M. Jambor, Hazle G. Corrigan and Katherine P. Bradway, Ph.D. San Francisco: San Francisco Department of Public Health, 1945. 68 pp.

**BUILDING THE FUTURE FOR CHILDREN AND YOUTH.** Next Steps Proposed by the National Commission on Children in War-time. Children's Bureau, U. S. Department of Labor. Publication 310. Washington, D. C.: Supt. of Documents, 1945. 59 pp. Price, \$.15.

**A CATALOG OF FILMS FROM BRITAIN MADE AVAILABLE IN THE UNITED STATES.** New York: British Information Services, 1945. 35 pp. Free from publisher, 30 Rockefeller Plaza, New York, N. Y.

**CHRONIC PULMONARY DISEASE IN SOUTH WALES COALMINERS.** III. Experimental Studies. By the Medical Research Council. Special Report Series No. 250. London: His Majesty's Stationery Office, 1945. 94 pp. Price, \$1.25.

**COMMUNITY ORGANIZATION FOR SOCIAL WEL-**

**FARE.** By Wayne McMillen. Chicago: University of Chicago Press, 1945. 658 pp. Price, \$4.75.

**EDUCATION IN TRAINING SCHOOLS FOR DELINQUENT YOUTH.** Bulletin 1945, No. 5. By Christine P. Ingram in collaboration with Elise H. Martens and Katherine M. Cook. Washington, D. C.: Supt. of Documents, 1945. 93 pp. Price, \$.20.

**EVERYDAY PSYCHIATRY.** By John D. Campbell, M.D. Philadelphia: J. B. Lippincott, 1945. 333 pp. Price, \$6.00.

**FACTS ABOUT RHEUMATIC FEVER.** Children's Bureau, U. S. Department of Labor. Publication 297. Washington, D. C.: Supt. of Documents, 1945. 9 pp. Free from publisher.

**FIRST AID TEXTBOOK.** By the American Red Cross. Rev. ed. Philadelphia: Blakiston, 1945. 254 pp. 264 illus. Price, cloth \$1.00, paper \$.60.

**THE GREAT STEWARDSHIP: A STORY OF LIFE INSURANCE.** By Albert W. Atwood. New York: Harper & Bros., 1945. 201 pp. Price, \$2.50.

**GROUP HEALTH INSURANCE AND SICKNESS BENEFIT PLANS IN COLLECTIVE BARGAINING.** By Helen Baker and Dorothy Dahl. Princeton: Princeton University Press, 1945. 89 pp. Price, \$1.50.

**HEALTH BULLETIN FOR TEACHERS.** Vol. XVI,

- 1944-1945. Modern American Health Heroes. 2nd series. New York: Metropolitan Life Insurance Co., 1945. 16 pp. Free.
- HEALTH PRACTICE INDICES, 1943-1944. American Public Health Association. New York: American Public Health Association, 1945. 87 pp. Free from publisher, 1790 Broadway, New York 19, N. Y.
- THE HOME TOWN JOB. A Report on Community Services for Veterans. By the National Committee on Service to Veterans. New York: National Social Work Council, 1945. 30 pp. Price, \$1.0.
- HOW TO RAISE A HEALTHY BABY. Complete Information from Birth to the Sixth Year. By L. J. Halpern, M.D. New York: Prentice-Hall, Inc., 1945. 388 pp. Price, \$1.95.
- IN THE DOCTOR'S OFFICE. THE ART OF BEING A MEDICAL ASSISTANT. By Esther Jane Parsons. Philadelphia: J. B. Lippincott, 1945. 295 pp., illus. Price, \$2.00.
- INTERNATIONAL HEALTH DIVISION. Annual Report, 1944. The Rockefeller Foundation. New York: Rockefeller Foundation, 1944. 159 pp. Free.
- JUVENILE DELINQUENCY AND THE SCHOOL. By William C. Kvaraceus. Yonkers-on-Hudson: World Book Co., 1945. 337 pp. Price, \$2.00.
- THE MANAGEMENT OF THE MIND. By Milton Harrington, M.D. New York: Philosophical Library, 1945. 200 pp. Price \$3.00.
- MICROBIOLOGY FOR NURSES. By Charles G. Sinclair, M.D. 6th ed. rev. Philadelphia: F. A. Davis, 1945. 265 pp. 69 illus. Price, \$2.75.
- ORAL HEALTH. By H. Shirley Dwyer, D.D.S. Philadelphia: W. B. Saunders, 1945. 132 pp. 12 illus. Price, \$1.25.
- PHYSICAL CHEMISTRY OF CELLS AND TISSUES. By Rudolf Hober, M.D. Philadelphia: Blakiston, 1945. 676 pp. 70 illus. Price, \$9.00.
- PHYSICIANS' GUIDEBOOK TO PUBLIC HEALTH LABORATORY SERVICES. Connecticut State Department of Health. Hartford: Connecticut State Department of Health, 1945. 128 pp. Free.
- PINEVILLE HIGH MEETS THE CHALLENGE. A story of the effects of Hookworm and ways of treating and preventing the disease. By Dorothy C. Stephens. Jacksonville: Florida State Board of Health, 1945. 54 pp. Price, \$1.0.
- THE PSYCHOLOGY OF SEEING. By Herman F. Brandt. New York: Philosophical Library, 1945. 240 pp. Price, \$3.75.
- REORGANIZATION OF COMMUNITY SERVICES. Prepared by the Committee of Consultants on Community Reorganization of the Woman's Foundation. New York: Woman's Foundation, 1945. 32 pp. Free from publisher, 10 E. 40th St., New York, N. Y.
- RORSCHACH'S TEST. II. A VARIETY OF PERSONALITY PICTURES. By Samuel J. Beck, Ph.D. New York: Grune & Stratton, 1945. 402 pp. Price, \$5.00.
- SAFEGUARDING YOUR HEALTH. A COMMUNITY HEALTH SERVICE. Morgantown: Monongalia County Health Dept. and West Virginia Public Health Training Center, 1945. 36 pp. Free.
- SCIENTISTS OF TOMORROW. Essays of the Winners of the Westinghouse Science Scholarships in the Fourth Annual Science Talent Search, 1945. Washington, D. C.: Science Service, 1945. 136 pp. (Not for sale.)
- STATE AND COMMUNITY PLANNING FOR CHILDREN AND YOUTH. Proposals of the National Commission on Children in Wartime. Children's Bureau, U. S. Department of Labor. Publication 312. Washington, D. C.: Supt. of Documents, 1945. 21 pp. Free from Children's Bureau, Washington 25, D. C.
- STRUCTURE AND FUNCTION OF THE HUMAN BODY. By Ralph N. Baillif, Ph.D., and Donald L. Kimmel, Ph.D. Philadelphia: J. B. Lippincott, 1945. 328 pp. 158 illus. Price, \$3.00.
- VAPOR ADSORPTION. INDUSTRIAL APPLICATIONS AND COMPETING PROCESSES. By Edward Ledoux. Brooklyn: Chemical Publishing Co., 1945. 360 pp. Price, \$8.50.
- VITAL STATISTICS OF PUBLIC HOUSING RESIDENTS. Pittsburgh Public Housing Reports No. 4. Pittsburgh: Federation of Social Agencies, 1945. 24 pp. Price, \$25.
- VITAMINS AND HORMONES ADVANCES IN RESEARCH AND APPLICATIONS. Vol. III. Edited by Robert S. Harris and Kenneth V. Thimann. New York: Academic Press, 1945. 420 pp. Price, \$6.50.
- WHAT THE INFORMED CITIZEN NEEDS TO KNOW. Edited by Bruce Bliven and A. G. Mezerik. New York: Duell, Sloan & Pearce, 1945. 377 pp. Price, \$3.00.
- WHEN YOU MARRY. By Evelyn Millis Duvall and Reuben Hill. New York: Association Press, 1945. 450 pp. Price, \$3.00.
- YOUR CHILD FROM ONE TO SIX. Children's Bureau, U. S. Department of Labor. Publication 30. Washington, D. C.: Supt. of Documents, 1945. 147 pp. Price, \$15.
- DENTAL HYGIENISTS. The Outlook for Women in Occupations in the Medical and Other Health Services. Women's Bureau, U. S. Department of Labor. Washington, D. C.: Supt. of Documents, 1945. Bulletin 203, No. 10. 17 pp. Price, \$1.0.

# ASSOCIATION NEWS

## STANDARD METHODS FOR THE EXAMINATION OF WATER AND SEWAGE

### Summary of Recommended Changes for the Ninth Edition

IN preparing the manuscript for the ninth edition of *Standard Methods for the Examination of Water and Sewage*, it was evident to the Joint Editorial Committee that a rather comprehensive revision, both in organization of material and of procedures, was desirable. Since no member of the committee was in a position to undertake such a revision, the American Public Health Association and the American Water Works Association on recommendation of the Joint Editorial Committee asked Dr. George E. Symons, Associate Editor of *Water Works and Sewage*, to serve as editorial consultant. Dr. Symons has been at work on this revision for the past 10 months. The manuscript is now complete, except for minor editorial changes. All portions have been submitted, after editing, for approval to at least one member of the committee, and in some cases the proposed text has been resubmitted to special committees which had prepared the original material. The methods for sewage examination were prepared by a special committee of the Federation of Sewage Works Associations and approved by the Board of Control of that Association for inclusion in *Standard Methods*. Only such changes in the sewage analysis methods have been made as were necessary for conformance to the style of *Standard Methods*.

The following summary of changes and additions for this ninth edition has been prepared by Dr. Symons.

#### A. Organization and Format—

Part I includes physical and chemical methods for water analysis. These methods have been arranged independently of the type of water being analyzed. Persons interested in special types of water will find the suitable methods under the appropriate constituent for which assay is required.

Part II contains methods for examination of sewage, sewage effluents, sludges, muds, and industrial wastes. Part III includes microscopic examinations. Part IV contains bacteriological methods.

Some of the procedures listed in Appendix I (Non-Standard Methods) of the eighth edition have been included as standard procedures, a few have been deleted, and a few added. Appendix II contains a new list of A.C.S. Reagent Grade Chemicals and a new section in which directions are found for making the more common laboratory reagents. This eliminates unnecessary repetition in the text. Directions for making special reagents are given in the main text.

The bibliographies have been revised and articles on which a method is based are listed in chronological order at the end of each section. Reference numbers have been eliminated. Cross-references now include page number as well as Part and Section. Formulas for calculating results are included in each determination. The Index has been revised and enlarged.

#### B. Revision of Methods—

##### Part I.—Examination of Water—Physical and Chemical

*Oxygen consumed:* Omitted.

*Odor:* Completely revised.

*Hardness:* Palmitate method added.

*pH:* Glass electrode method added.

*Carbon dioxide:* Includes evolution technique and new table and graph for calculation from ionic activities.

*Bicarbonate ion:* Formulas for calculation.

*Carbonate ion; hydroxyl ion:* Precipita-

tion methods, and formulas for calculation.

*Oil*: Evaporation and extraction, or wet extraction.

*Silica*: Variations of colorimetric method added.

*Arsenic*: (New) Gutzeit method.

*Aluminum*: Colorimetric method using aurin-tricarboxylic acid.

*Iron*: Bipyridine, and phenanthroline colorimetric methods added.

*Chromium*: (New) Colorimetric method using diphenylcarbazide.

*Zinc*: Nephelometric method only.

*Calcium*: Revised.

*Magnesium*: Titan yellow method added.

*Sodium*: Uranyl zinc acetate reagent.

*Potassium*: Colorimetric method added, using sodium cobaltinitrite and potassium dichromate.

*Chloride*: Both Volhard and Mohr Methods.

*Fluoride*: Scott modification of Sanchis's Method (AWWA Committee).

*Ortho-phosphate*: (New) Oravimetric and colorimetric using amino-naphthol-sulfonic acid or stannous chloride.

*Pyro-phosphate*: (New) Manganous chloride separation or difference method.

*Meta-phosphate*: (New) Barium chloride separation or difference method.

*Boron*: Electrometric titration.

*Cyanide*: Colorimetric, using yellow ammonium sulfide.

*Tannin and Lignon*: (New) Colorimetric or photometric using phosphotungstic or phosphomolybdic acids.

*Residual Chlorine*: Completely revised by AWWA Committee, including orthotolidine method, iodometric method, orthotolidine arsenite method and drop dilution method for field use.

*Chlorine Demand*: Two methods, one for Laboratory use and one for field use. (AWWA Committee.)

*Dissolved Oxygen*: Revised.

*Hydrogen-Sulfide*: Evolution or colorimetric method or calculation from pH.

*Methane*: (New) Gasometric method

**Part II: Sewage, Sewage Effluents, Industrial Wastes, Polluted Waters, Sludges, and Muds.**

The revision by the Committee of the Federation of Sewage Works Associations contains these significant changes:

*Albuminoid Nitrogen*: Deleted.

*Organic or Total Nitrogen*: Distillation into Boric Acid.

*Nitrate Nitrogen*: Revised to include

technics for industrial wastes, and colored sewage.

*Dissolved Oxygen*: Completely revised, Alsterberg and Alum Flocculation Method added. D. O. in Activated Sludge added.

*Oxygen Consumed*: Procedure for brine and strong sewage added.

*Biochemical Oxygen Demand*: Standard dilution water, procedure for chlorinated sewage and dilution method for sludges and muds added.

*Residue or Solids*: New method for settleable solids.

*pH*: Glass electrode new standard.

*Residual Chlorine*: Revised to conform to technic for Water, Orthotolidine, starch iodide methods; spot plate test for field use.

*Chlorine Demand*: Conforms to technic for water.

*Sulfides*: Methylene Blue colorimetric method added.

*Grease*: New extraction technic using petroleum ether.

*Solids in Activated Sludge*: (New) Aluminum dish method.

**Part III. Microscopical Examination of Water, Sewage Sludge, and Bottom Sediments:** revised and rewritten. New equipment and new forms for reporting results are included.

**Part IV. Bacteriological Examination of Water.** Tryptone Glucose agar has been added as a plating medium, and Lauryl Sulfate Tryptose Broth for coliform test. Fuchsin broth and Formate Ricinoleate broth have been deleted as a confirmatory medium. The schematic outlines have been revised, as has the section on coliform density. Bacteriological examination of water from swimming pools is included as a standard method. The Eijkman test has been added to the section on differentiation.

**Appendix I: Non-Standard Methods.**

New sections introduced into the Non-standard Methods include Chromium, Selenium, Volatile Acids in Digestive Sludge, Oxygen Demand and Activity of Activated Sludge, Grease in Sewage Sludge (by wet extraction and by extraction of coagulated sludge), and Colorimetric pH of Sewage and Sludge.

Revised sections in Appendix I include Phenols in Water, British Bacteriological Practice, and Organic Carbon in Sewage. Other sections taken from the 8th edition include pH Buffers and Indicators, Lead, and Phenols in Streams.

JOHN F. NORTON, PH.D., Chairman  
Joint Editorial Committee

In our opinion the Ninth Edition of Standard Methods for the Examination of Water and Sewage has been carefully prepared under good auspices and is now ready to be considered on its merits. Since it is physically impossible to circulate the manuscript, we recommend that this digest as prepared by

Dr. Norton and Dr. Symons be accepted as representing the changes proposed in the new edition.

KENNETH F. MAXCY, M.D., *Chairman*  
Committee on Research and Standards

ABEL WOLMAN, DR.ENG., *Chairman*  
Executive Board

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Jayanta K. Bhattacharya, M.B., D.P.H.,  
Rockefeller Foundation, 49 W. 49 St., New  
York 20, N. Y., Officer-in-Charge of  
Training, Singur Health Center, Govern-  
ment of Bengal

Frank V. Chappell, M.D., M.P.H., 1420  
Tampa St., Tampa, Fla., Director, Hills-  
borough County Health Dept.

James Z. Davis, M.D., 115 South State St.,  
Salt Lake City, Utah, Health Commissioner

Ernest M. Conrad, M.D., 615 Anderson  
Bank Bldg., Anderson, Ind., Commissioner  
of Health, Anderson and Madison County  
Grady Deaton, M.D., Civil Courts Bldg.,  
Houston, Tex., Director, Harris County  
Health Unit

Dr. Pedro Martinez-Saravia, Independencia  
No. 2, Santiago, Chile, Medico Inspector  
General, Direccion General de Sanidad

John W. Smillie, M.D., U.S.P.H.S., 300½  
Broad St., Albany, Ga., Asst. Surgeon, U. S.  
Public Health Service

Ruth J. Temple, M.D., M.P.H., 5425 South  
Central Ave., Los Angeles, Calif., District  
Health Officer, City Health Dept.

### *Laboratory Section*

Edward C. Berry, Ph.D., Kadlec Hospital,  
Richland, Wash., Bacteriologist

Luis Fernando Gomez-Lince, M.D., Instituto  
Nacional de Higiene, Guayaquil, Ecuador,  
Head of Diagnostic Dept.

Major John D. Reese, M.C., Ninth Service  
Command Laboratory, Fort Lewis, Wash.,  
Executive Officer

### *Vital Statistics Section*

Octavio Cabello G., M.P.H., C.E., Direccion  
General de Sanidad, Santiago, Chile, Jefe-  
subrogante, Departamento de Bioestadistica  
George Kerchner, 140 Clarkson Ave., Brook-

lyn 26, N. Y., Senior Statistician, New  
York City Dept. of Health

### *Engineering Section*

Glenn J. Hawkins, 310 Australian Ave., Palm  
Beach, Fla., Sanitary Technician, U. S.  
Army Air Forces

Roy N. Johnston, C.E., State Board of  
Health, National Reserve Bldg., Topeka,  
Kans., Engineer for Local Health  
Administration

James A. Reyniers, M.S., 1310 Grant St.,  
Niles, Mich., Professor of Research Bacteri-  
ology and Director, Laboratories of  
Bacteriology, University of Notre Dame  
Richard A. Rhodes, Somerville, Tenn., Senior  
Sanitarian, Fayette County Unit of Ten-  
nessee State Public Health

### *Food and Nutrition Section*

Lillian Anderson, M.A., Community Service  
Society, 105 E. 22 St., New York 10, N. Y.,  
Director, Nutrition Bureau

Virginia A. Beal, M.P.H., 55 Shattuck St.,  
Boston 15, Mass., Asst. in Nutrition, De-  
partment of Maternal and Child Health,  
Harvard School of Public Health

Robert F. De Long, M.S., 6525 So. California  
Ave., Chicago 29, Ill., Chief Bacteriologist  
in charge of Research and Technical Serv-  
ice, National Aluminate Corp.

Elizabeth A. Porter, 41 W. Turnbull Ave.,  
Upper Darby, Pa., Nutritionist, State Dept.  
of Health

G. Dorothy Williams, M.S., 125 Worth St.,  
New York 13, N. Y., Chief, Nutrition  
Division, Dept. of Health

### *Maternal and Child Health Section*

Hart E. Van Riper, M.D., National Founda-  
tion for Infantile Paralysis, 120 Broadway,  
New York 5, N. Y., Asst. Medical Director



*Public Health Education Section*

- Virginia C. Acland, M.P.H., 10 Chestnut St., Quincy, Mass., Public Health Educator, Anti-Tuberculosis Assn. of Quincy
- Jacob R. Bitner, M.A., 2315-20th St., Columbus, Nebr., Supt. of Schools
- Lenore E. Headley, 310 Cedar St., New Haven, Conn., Student, Yale School of Public Health
- Lloyd M. Jones, Ph.D., 112 Irvin Hall, Penn. State College, State College, Pa., Professor of Physical Education
- M. Elizabeth Knowles, M.S., 4812 Baltimore Ave., Philadelphia 43, Pa., Director of Social Service, Hospital of the Woman's Medical College of Pennsylvania
- Sister M. Leonis, M.S., 5303 McBride Ave., Cleveland 4, Ohio, Director, St. Alexis School of Nursing
- Aletha J. Moody, 4006 Lee Highway, Arlington, Va., Exec. Secy., Arlington County Tuberculosis Assn., Inc.
- Edward W. Palmer, Ed.M., 1551 Franklin Ave., Mineola, N. Y., Exec. Secy., Nassau County Cancer Committee

*Public Health Nursing Section*

- Elizabeth G. Bell, 310 N. Pine, Santa Maria, Calif., Staff Nurse, Santa Barbara County Health Dept.
- Clinton E. Burnett, M.A., 515 North Carancahua, Corpus Christi, Tex., Asst. Superintendent and Supervisor of Nurses, Corpus Christi Independent School District
- Mary F. D. Chamberlain, M.A., Box 251, Marysville, Calif., Supervising Public Health Nurse, Sutter-Yuba Health Dept.
- Helen V. Connors, R.N., 270 Fairmont Ave.,

Jersey City, N. J., Head Nurse, Metropolitan Life Insurance Company Nursing Service

- Katherine M. MacMillan, R.N., 636 Grand Ave., St. Paul 5, Minn., Asst. Director, St. Paul Family Nursing Service
- Pearl V. Sayles, Rt. 1, Box 246, Tucson, Ariz., Supervising Nurse, Pima County Health Dept.
- Marie E. Wallace, 3828 N. Chesterbrook Road, Arlington, Va., Public Health Nursing Consultant, Employees Health Service, U. S. Public Health Service

*School Health Section*

- William H. Gilliatt, M.D., 446 N. 5th, Coalinga 1, Calif., School Physician
- Barbara B. Kebe, M.S.P.H., Bishop College, Marshall, Tex., Health Educator and Director, Health Education Dept.
- Harriet E. Spangler, R.N., 33 Third St., Hanover, Pa., School Nurse, Hanover Public Schools
- Edward J. Storey, Ed.D., 330 Carroll Ave., Mamaroneck, N. Y., Director of Health and Physical Education, Mamaroneck Public Schools
- Edith G. Bearer, R.N., 22 McKee Ave., Monessen, Pa., School Nurse and Home Visitor, Monessen Board of Education

*Unaffiliated*

- Per Johannes Hedenius, M.D., Sjukhusdirektionen, Vasagatan 6, Stockholm, Sweden, Medical Adviser to Swedish Legation
- Amadeo Vicente-Mastellari, M.D., P. O. Box 629, Panama City, Rep. of Panama, Director, Division de Tuberculosis, Seccion de Sanidad y Asistencia Publica

#### APPOINTMENT OF COMMITTEE FOR THE EVALUATION OF METHODS TO CONTROL AIR-BORNE INFECTIONS

A subcommittee of the Committee on Research and Standards has been appointed to study methods for the control of air-borne infections. Personnel of the committee is as follows:

James E. Perkins, M.D., *Chairman*  
 F. W. GILCREAS  
 Alexander Hollaender, Ph.D.  
 Alexander Langmuir, M.D.  
 O. H. Robertson, M.D.  
 William F. Wells  
 George M. Wheatley, M.D.  
 C. P. Yaglou

Dr. Perkins has described the purposes of the committee in his review article "Evaluation of Methods to Control Air-borne Infections" published in the September *Journal*.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing Officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

### POSITIONS AVAILABLE

(Supplemental to list in November Journal)

**Wanted:** Medical officers for positions. Director of preventable diseases, director of maternal and child health, district health officers; excellent opportunities for right men. Salary to start \$4,500 year and travel expense. Positions permanent. Write G. F. Campana, M.D., State Health Officer, Bismarck, N. D.

**Wanted:** Full-time health officer. If interested address George A. Tierney, 164 Court St., Middletown, Conn., stating age, qualifications and minimum salary expected.

**Tuberculosis Control Officer Wanted:** Position of Director of Division of Tuberculosis Control, Seattle Department of Health, to be available January 1, 1946. Applicant must be physician qualified for license in State of Washington and have specialized training and/or experience in clinical tuberculosis and public health tuberculosis control. Full-time position, salary \$5,940 plus reimbursement for travel. Apply Emil E. Palmquist, M.D., Commissioner of Health, Seattle 4, Washington.

**Wanted Immediately:** Medical Director to administer state-wide services to crippled children. Minimum requirements include public health background, special training in pediatrics. Write giving personal data, background and training. Salary \$4,500. Address Carlyle D. Onsrud, Executive Director, State Welfare Board, Bismarck, N. D.

**Wanted:** Experienced Health Officer by newly organized Bi-County Health Department, Southern Illinois. Starting salary \$5,000 plus travel allowance. Applications received by Mr. Lloyd Cannon, Olmstead, Ill.

Western state seeks two physicians for county health officer positions, one paying \$4,800, the other \$5,000. Applicants must be graduates in medicine from approved medical school, have not less than

1 year clinical experience in hospital having standards approved by the AMA, successful completion of not less than 1 academic year graduate work in fundamental subjects of preventive medicine in a recognized school of public health. Address Box RL, Employment Service, A.P.H.A.

**Health Educator Wanted:** Must be experienced in community organization on broad health lines. Position expected to lead to executive secretaryship. Salary \$2,600. Suburb of New York City. Address Box CO, Employment Service, A.P.H.A.

**Health Officers Wanted:** Positions for bureau directors and district and county health officers now open. Salaries range from \$3,900 to \$8,400 varying with education and experience and duties assigned. Liberal retirement plan and travel allowance. Write Merit System Supervisor, Florida State Board of Health and Crippled Children's Commission, 201 Professional Building, Gainesville, for application form and full details.

**Louisville and Jefferson County Health Department** urgently in need of two public health nurses (one Negro, one white) to act as tuberculosis consultants, advise field nurses regarding home visits, participate in student educational program and staff educational program and act as consultants to tuberculosis clinics. Beginning salary \$175 per month. Apply Prentiss M. Terry, Director, Louisville Civil Service Board, 300 City Hall, Louisville, Ky.

**Wanted:** Qualified physicians and nurses with public health education and experience for key positions in the Latin American Republics. For particulars, communicate with Personnel Director, Office of Inter-American Affairs, 499 Pennsylvania Avenue, N.W., Washington 25, D. C.

**Health Educator Wanted:** For position in voluntary organization in north-eastern U. S. Applicant must have specialized training in health education and some experience in community organization. Salary arranged according to experience and training. Apply Box MT, Employment Service, A.P.H.A.

**Wanted:** Dental Hygienists for up-to-date comprehensive program with adults, preschool and school children; full year positions; tenure of office; good salary and liberal travel allowance. Apply Division of Dental Health, State Bureau of Health, Augusta, Me.

**Territorial Department of Health—Juneau, Alaska—**wants public health staff nurses. Minimum salary \$245 South-eastern, \$281.75 Interior. Minimum

qualifications necessary: year of public health in school of nursing approved by N.O.P.H.N. and two years' experience, one under qualified supervision, preferably in V.N.A. or rural public health. Vacation one month, 14 days sick leave, 38 hour week. Apply directly to Director, Division of Public Health Nursing, Box 1931, Juneau, Alaska.

**Wanted:** Assistant Chief, Division of Child Hygiene, Ohio Dept. of Health. Salary \$4,400-\$4,800. Must be graduate of approved medical school, have 1 year's graduate training, plus 1 year training or experience in clinical pediatrics. Experience in maternal and child health desirable. Must be licensed in Ohio or eligible for licensure. Apply Chief of Div. of Child Hygiene, Dept. of Health, State Dept. Bldg., Columbus 15, Ohio.

#### POSITIONS WANTED

**Bacteriologist**, age 31, B.A. and M.S. at State University of Iowa. Six years' experience in bacteriology and public health. Seeks teaching fellowship to finish Ph.D. degree. L-479

**Research bacteriologist**, Ph.D. 1941, Sanitary and Food Bacteriology, just released from active duty in Sanitary Corps, wishes position with university or commercial laboratory. Especially interested in water and sewage treatment and purification and in food, bottling and distilling industries. L-478

**Public Health Engineer**, age 40, asso-

ciate member ASCE, shortly to be released from armed forces desires position in public health or sales engineering. E-486

**Veterinarian** with 3 years' experience in army meat and milk inspection seeks position with city or state health department. Well qualified in animal disease control. M-461

**Sanitary or public health engineer**, age 26, M.S. Harvard, seeks position in northeastern U. S. Experience with U. S. Public Health Service and as sanitary inspector. E-487

[END OF A.P.H.A. LISTING]

## Opportunities Available

### Advertisement

**WANTED**—(a) Chief of the division of medical services, state department of public assistance; two years' graduate training in pediatrics or orthopedics desirable; duties consist of directing crippled children's program, supervising the adult physical rehabilitation program and serving in an advisory capacity; Southeast. (b) Young physician, man or woman, to join student health department, co-educational college; Pennsylvania. (c) Public Health physician to serve three counties; \$5,000, traveling expenses; Middle West. (d) Student health physician; enrollment of 5,000 students; more than 400 on faculty; well-equipped department; Pacific Coast. (e) Young physician with public health background to serve in student health department of university and, also, in department of public health of the medical school; East. (f) Young physician qualified in public health to become associated with program engaged in the production of audiovisual aids toward more satisfactory teaching of preventive medicine and tropical diseases. (g) Several dentists to become associated with department of health; South. **PH12-1** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Health educator; should have master's degree in education, major in health education and experience in community health education work; advantageous if experienced in community organization; state tuberculosis association; East. (b) Statistician; college graduate especially interested in mathematics required; nursing organization; somewhat rural location; South. (c) Executive secretary; health division comprised of 35 agencies, public and private and serving community of a million population; candidate well-trained in public health field with experience in community or-

ganization and health education required; man, not over forty or forty-five, with degree in public health and several years' experience in a health agency required. (d) Health educator to organize and direct program of dental health education; duties include working quite closely with the public schools; must be well qualified in public relations; dentist qualified in public health work eligible; \$3,600-\$5,000. (e) Health educator with administrative ability to become associated with Rehabilitation program; Middle West. **PH12-2** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

**WANTED**—(a) Educational director, combined organization composed of nursing division of county health department, municipal health department and visiting nurses association; must be capable of assisting with development of new organization; Middle West. (b) Outpatient supervisor; unit of university center in Middle West; \$200-\$225. (c) Three public health nurses; generalized program in modern city health department including antenatal, postnatal, infant, preschool and school hygiene, communicable disease, tuberculosis and venereal disease control; certificates required; central metropolis. (d) Assistant supervisor of nurses and, also, several staff nurses; public health organization, inaugurated two years ago; generalized program; growing organization; excellent opportunity for advancement; South. (e) Public health instructor, university school of nursing; bachelor's degree and some experience in public health nursing required; university medical center; East. (f) Two dormitory nurses; each dormitory houses approximately 200 young women; co-educational college; opportunity for continuing studies toward Bachelor or master's degree; Middle West. **PH12-3** The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11.

## Opportunities Wanted

### Advertisement

Dentist, Veteran World War II; certificate from Forsyth Infirmary for Children; several years, public health experience and two years' private practice before joining Armed Forces; available immediately; for further information, please write Burneice Larson, Director, The Medical Bureau, Palmolive Building, Chicago 11.

Well trained public health physician is available for an appointment of administrative character; A.B., M.D., M.P.H. degrees, leading schools; several years, epidemiologist, state department of health; past four

years has held important administrative appointment with large teaching institution; for further details, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public Health Nurse—is available for executive position; B.S. degree Columbia; three years, supervising nurse, state department of health; five years, field supervisor, large industrial company; four years, educational director, public health department, college of nursing.

## NEWS FROM THE FIELD



*Courtesy of The United States Public Health Service*

**RETIRING WOMEN SCIENTISTS HONORED**—Drs. Ida Bengtson and Alice Evans were guests of honor at a retirement dinner in Washington, D. C., commemorating their years of service with the National Institute of Health, United States Public Health Service. Dr. Bengtson is noted for the preparation of the standard for gas gangrene toxins and antitoxins used by the League of Nation's Health Committee in Copenhagen, Denmark. Dr. Evans studied undulant, or Mediterranean fever. Facing the camera, Assistant Surgeon General L. R. Thompson, Dr. Ida Bengtson, Dr. Alice Evans, Dr. Rolla E. Dyer, Director of the National Institute of Health, and Dr. Margaret Pittman.

### A REGIONAL HOSPITAL PROJECT IN NEW YORK STATE

"Seven counties in western New York, forming the trading area of Rochester, have been chosen as the locus of an experiment in regional hospital organization. These counties, Livingston, Monroe, Ontario, Orleans, Steuben, Wayne, and Yates, stretching from Lake Ontario to the Pennsylvania border, have an area of 4,715 square miles and a total population of 713,862, including 324,975 in Rochester. Out-

side Rochester there are seventeen hospitals, all but five (which together have only 11 per cent of the total bed capacity) being voluntary. It is proposed that these hospitals shall join with the six hospitals in Rochester in coöperation for the betterment of medical and hospital service throughout the region. Educational services would come to focus in the University of Rochester but would be shared by several hospitals in the city.

"In the words of Mr. Southmayd,

director of the Fund's Division of Rural Hospitals, the heart of the experiment is to determine whether a better distribution of better medical care can be achieved through 'concerted voluntary action by hospitals through representative organization on a regional scale.' Such improvement might come about through several channels: the extension of educational opportunities by urban hospitals, and particularly teaching hospitals, to physicians and hospital personnel throughout the region; the exchange of interns and residents; the development of consulting services in clinical medicine, laboratory medicine, and hospital administration; the establishment of accepted standards of administration and operation in all the coöperating hospitals; the initiation of desirable joint services, such as purchasing; and the rational distribution of adequate hospital facilities throughout the region. To initiate and guide such developments it is proposed to establish a membership organization, in which urban and rural hospitals share on an equal footing, with a full-time executive staff.

"Such an experiment in intercommunity organization has few precedents, and an important factor in the decision to begin the experiment in the Rochester region was the maturity of community organization in Rochester itself. The city has a well established Council of Social Agencies and a strong Community Chest; an Industrial Management Council, which has thrown corporate influence behind the development of a successful hospital prepayment plan; and a Hospital Council already functioning smoothly as the joint agent of the six hospitals in the city. Both the machinery and the will to coöperate effectively are present.

"Furthermore, the region as a whole is prosperous, well supplied with hospital beds and with physicians. The quality of hospital service both in and

out of Rochester is above the average. In the opinion of the Fund, this is a situation in which the influence of regional organization can be determined—as nearly as is ever possible in the complicated field of social relationships—as a single variable. If, as the Fund hopes, this influence should prove to be considerable and beneficial, it should be possible to recommend the plan with confidence to other regions.

"Through the community fund Rochester will provide \$10,000 initially toward the administration of this experiment. The Commonwealth Fund has indicated its willingness to provide \$75,000 more for this purpose and up to a maximum of \$200,000 annually for capital improvements, over a period of at least five years. The award is conditioned on the early establishment of an organization in the Rochester region capable of conducting the experiment along the lines suggested by the Fund." — *Commonwealth Fund News Letter*, Oct., 1945.

#### DR. DOULL APPOINTED TO OFFICE OF INTERNATIONAL HEALTH RELATIONS

Dr. James A. Doull, Elizabeth Severance Prentiss Professor of Preventive Medicine and Public Health in the School of Medicine, Western Reserve University, has resigned to join the Regular Corps of the U. S. Public Health Service. His resignation from Western Reserve will take effect March 31, 1946.

In his new position, Dr. Doull will have charge of the newly established office of International Health Relations in the Office of the Surgeon General. In this capacity he will work in close coöperation with the Division of International Labor, Social and Health Affairs in the Department of State. It is anticipated that in the near future a new international health organization will be formed and brought into relationship with the United Nations

Organization and with existing international organizations working in health and related fields. As one of the leading countries in public health matters, the United States will be expected to take an active part in developing the new organization.

Dr. Doull brings a wealth of pertinent experience and knowledge to his assignment. He is widely known for his research work, especially his studies on the common cold, diphtheria, leprosy, and tuberculosis. He has been prominent in the community health affairs, a member of the advisory Board of the Division of Health, Vice Chairman of the Cleveland Health Council, Chairman of the Advisory Council of the Cleveland Health Council, Chairman of the Advisory Council of the Cleveland Health Museum, and President of the Hearing and Speech Center.

On the national level he is a member of the Executive Board and Governing Council of the American Public Health Association and a member of the Advisory Medical Board of the American Leprosy Foundation. He has acted as Editor of the *International Journal of Leprosy*.

Dr. Doull has had three foreign assignments during the war. The first was a special mission to the Pacific for the Lend-Lease Administration to assist Australia and New Zealand to obtain urgently necessary medical supplies. The second was to England for the United Nations Relief and Rehabilitation Administration as a member of an international committee convened in London to draft new sanitary conventions for maritime and aerial commerce and regulations for the medical control of displaced persons in Europe. The third was to Europe with regard to preliminary arrangements for the proposed international health organization. He also attended the San Francisco Conference as an assistant to the United States Delegation.

#### MESSAGES FROM ABROAD

Dr. Frank G. Boudreau has shared with the Association letters from two of the best known public health workers in Europe. The situation of these two leaders described in the following extracts from their letters needs no further comment. Readers of the *Journal* who would like to share some of their surplus professional books and publications with either or both of these colleagues may send them to Dr. Boudreau for shipment abroad. Address: Dr. Frank G. Boudreau, Millbank Memorial Fund, 40 Wall Street, New York, N. Y.

Dr. Andrija Stampar wrote from London on September 19, 1945:

"I came back to my home after I had been imprisoned and interned in Germany for four years. My oldest daughter also came back after she spent three years with partisans. Now we are all at home.

"I had been dismissed from the Faculty on the same day when in April, 1941, Germans occupied Zagreb. In addition I was imprisoned and handed over to the Gestapo. My wife had also been dismissed, and she lived in Zagreb under very difficult conditions, practically without any means. She was brave waiting for me. Finally our day came. It was wonderful to come to liberated Zagreb. My dear wife and children at the moment could not recognize me because I have lost almost one-third of my weight.

"I am again at the Medical School and my wife at the School Polyclinic.

"My country is recovering from many wounds inflicted upon it during last four years. Young and dynamic people are in charge of public health. They have some new views but lately they are working with us. Generally speaking I am optimistic.

"Could you forward to me public health journals and some important books? We are very much in need of them."

Dr. J. H. Tuntler, formerly Chief Medical Officer at Groningen, The Netherlands, was Chief Medical Officer in Amsterdam when the Germans came. He writes:

"After five terrible years of war I am happy to write to you, my first letter to a friend from overseas. You cannot understand

what it means to be a prisoner in your own country, in your own town, in your own house, for five long years. But it is still more difficult to understand what, after this period of oppression, means liberty, liberty of action, of conscience, the right of free speech, freedom of the press. We are as a bird released from the cage. We forgot how to fly. . . . You have seen our beloved country and you know how rich it was. You cannot recognize it now. It is a complete ruin. . . . We lost all contact with the civilized world and with the scientific and social workers from abroad. A great part of my books is lost. The Germans burned many libraries and they stole whatever they could lay their claws on. Will you be so kind as to send me some books or other publications on public health? There are no new medical books here and we cannot buy them from abroad. Books and other publications are the only means of recovering the ground we lost during the war.

#### FIFTY YEARS OF PUBLIC SERVICE

Dr. Sandor Horowitz, Peoria, Ill., was presented with a 50 year pin and certificate by the Illinois State Medical Society upon the completion of 50 years of public service to the people of Peoria County. A scroll signed by members of the local medical society accompanied the honors which were presented at a dinner meeting held in Peoria on September 18. Dr. Horowitz was graduated from the Missouri Medical School which later became the School of Medicine of Washington University, and has practised in Peoria since 1895 as city physician, police surgeon, chief physician of the Hospital for Contagious Diseases, and as Commissioner of Health. He served as First Lieutenant and Captain in the Medical Reserve of the First World War. Since 1931, Dr. Horowitz has held the position of district health superintendent and assistant epidemiologist, Illinois State Department of Health.

#### ALASKA'S NUMBER ONE HEALTH PROBLEM

The most serious and pressing problem confronting the new Board of

Health in Alaska is the steadily increasing spread of tuberculosis. This is no new situation. The surveys of the American Public Health Association in 1940 and 1943 recommended expansion of facilities in this direction, but the war conditions (influx of population, overcrowding, lack of housing facilities, etc.) have aggravated conditions, and recent studies by the Board of Health reveal an estimated 4,000 cases in the Territory with but 289 beds to care for them. The board has urged the immediate transfer of military surplus property, hospital equipment, and buildings to the Territory, offered the fullest coöperation with the Alaska Tuberculosis Association, and passed a formal resolution urging the Territorial Legislature to appropriate \$253,122 (to be matched by federal funds—\$258,667) for an adequate hospitalization program for the treatment of tuberculosis, starting with the fiscal year, June 1, 1946.

#### COÖPERATION OF STATE DEPARTMENTS IN HEALTH EDUCATION IN GEORGIA

Georgia has a "pilot plant" in health education. With the assistance of a grant from the W. K. Kellogg Foundation, four rural counties in different parts of the state have been selected as "Health Project Counties" for a demonstration in an integrated health education program sponsored jointly by the Department of Public Health and the State Education Department. The State School Supervisor, J. M. Gooden, is acting as State Coordinator. The first step in the project was a six weeks' summer workshop in health education for teachers and principals at the Georgia State College for Women and at Atlanta University. To facilitate the program it is planned that "all community resources which can contribute to a sound and well rounded



health education program will be called on for assistance." If the expected results follow the program will be made state-wide.

#### POST-WAR JOBS FOR PUBLIC HEALTH NURSES

The National Organization for Public Health Nursing has issued a leaflet, *Your Postwar Job*, for nurses returning from military service. It is being distributed to professional and non-professional organizations for use in vocational guidance programs for nurse-veterans, according to Ruth Houlton, R.N., General Director.

"Nurses are already returning from military service, for various reasons, at the rate of approximately 400 a month," Miss Houlton stated, "and it is important that they receive guidance in choosing the field of civilian nursing that makes the best use of their skills and where they are most needed. There have never been enough public health nurses in this country and at present some health departments and visiting nurse associations have from 20 to 30 per cent vacancies on their nursing staffs."

Copies of the leaflet are free on request from the National Organization for Public Health Nursing, 1790 Broadway, New York 19, N. Y.

#### GORGAS MEDAL AWARDED CAPTAIN COGGESHALL

The Gorgas Medal, awarded annually since 1942 for outstanding work in preventive medicine for the armed forces, has been presented this year by the Association of Military Surgeons, to Capt. Lowell T. Coggeshall of the U. S. Navy, an expert on tropical disease, "for distinguished service to our military forces in establishing new principles in the management of patients suffering from psychic disturbances as well as physical deterioration from the effects of malaria and filariasis."

#### MEDICINE TODAY

The New York Academy of Medicine has announced the Eleventh Series of Lectures to the Laity during the current year. Future sessions, which began in November, will be held at 8:30 P.M. on December 13 and 27 and on January 10 and 24.

The program on December 13 includes an address by Basil C. MacLean, M.D., Rochester, N. Y., on The Hospital and the Laboratories. That on January 10 concerns the layman's part in medicine and preventive medicine by Edward S. Rogers, M.D., Albany, N. Y. The January 24 session is on economics and medicine, Alternative and Multiple Solutions to the Problems of Medical Costs, by Dean A. Clark, M.D., New York, N. Y.

#### STATE AND TERRITORIAL HEALTH OFFICERS DECLARE PRINCIPLES OF SCHOOL HEALTH PROGRAMS

Dr. Vlado A. Getting, Boston, Mass., Secretary-Treasurer of the Association of State and Territorial Health Officers, announced recently a resolution adopted by the Association proposing a division of the responsibility for school health services between the departments of health and education. According to this resolution, the primary responsibility for the educational aspects of health education are those of the school authorities. However, the prime responsibility for rendering services as given by the physician, nurse, dentist, and others, is in the opinion of this group that of the health department. The State and Territorial Health Officers believe that only by integrating the work of these two departments can the school health program be a success and its ultimate goal of optimal health for all the students be achieved. The health officers have indicated their intention to support or oppose any legislation pertaining to school health on the basic principle outlined in this resolution.

## LASKER AWARD

On November 1, at the annual luncheon of the National Committee for Mental Hygiene, the Lasker Award for outstanding service in rehabilitation was conferred jointly on Dr. John Rawlings Rees, Consultant in Psychiatry to the Directorate of Psychiatry of the British Army, and Major General G. Brock Chisholm, Deputy Minister of National Health, Federal Department of National Health and Welfare, Canada. The presentation was made by General Omar N. Bradley.

The Lasker Award of \$1,000, established in 1944 by the Albert and Mary Lasker Foundation, is given annually through the National Committee for Mental Hygiene for meritorious service and significant contributions to promoting mental health and increasing public understanding of mental hygiene.

MISS STRACHAN RETIRES FROM  
THE N.T.A.

On July 1, 1945, Miss Louise Strachan retired from the headquarters staff of the N.T.A. where she had served consecutively since 1921, and later, since 1925, as Director of the Child Education Service. She started her work in tuberculosis in 1917 with the Tuberculosis Committee of the State Charities Aid Association and was also from 1919 to 1921 the Secretary of the Ontario County Tuberculosis Committee.

She spent 1928-1929 in Europe studying health education methods; in 1931 she organized the first National Conference on College Hygiene; in 1936 she was appointed by President Roosevelt as United States representative at the 3rd International Congress on Open Air Schools held in Germany. There she presented a paper on the Evolution of the Open Air School in the United States.

She is the author of *Fifteen Years of Child Health Education* and of *The*

*Place of Child Health in a Tuberculosis Program*, as well as many articles in health and education journals.

A member of the American Public Health Association since 1920, she was elected a Fellow in 1932. She also served as Chairman of the Library Committee of the National Health Council and spent herself prodigally in building up interest in the Library and in its usefulness to health workers.

She will be missed by the Council agencies but her work will go on, for after a brief rest she will devote part of her time to further research in health education of school children.

A POLIOMYELITIS TREATMENT TRAINING  
CENTER IN NEW YORK CITY

New York's first medical center for the specialized training of doctors, nurses, and other professional personnel in the treatment of poliomyelitis was established at Knickerbocker Hospital in October, 1945. Dr. Philip M. Stimson, Associate Professor of Pediatrics at Cornell Medical School, will direct the unit, assisted by 3 physicians, 5 physical therapists, 1 occupational therapist, 18 nurses, and an executive secretary. One floor of 35 beds has been set aside for the unit. All phases of treatment will be included and training facilities in the newest techniques of treating the disease will be available to physicians from all parts of the country.

The budget of about half a million dollars for special equipment, treatment of patients, education, and hospital charges for those unable to pay has been provided jointly by the New York Chapter and the National Foundation for Infantile Paralysis.

CONNECTICUT COMMISSION ON THE  
CARE OF THE CHRONICALLY ILL

The 1945 session of the Connecticut legislature set up a Commission of five members and the Commissioners of Health and of Welfare, ex-officio, on the

care of the chronically ill, aged, and infirm. Provision is made for a study of the problem, an initiation of a program, including necessary building, the coordination of existing facilities, and the drafting of appropriate legislation. The first year's appropriation is \$25,000.

#### CANCER RESEARCH PROGRAM

A sum of \$500,000, from funds raised during the spring of 1945 cancer campaign, is being made available by the American Cancer Society for initial steps in a cancer research program. The fund is to be divided among chemical, biological and clinical research, and research in physics, of which \$50,000 is recommended for fellowships to be given scientists released from the armed services who will engage in cancer research.

#### CATTARAUGUS COUNTY TUBERCULOSIS ASSOCIATION CELEBRATES TWENTY- FIVE YEARS

A twenty-fifth anniversary celebration of the founding of the Cattaraugus County Tuberculosis and Health Association was held in Olean, N. Y., on October 11. The principal speaker was Herman M. Hilleboe, M.D., Chief of the Tuberculosis Control Division of the U. S. Public Health Service, Washington, who urged an impartial survey of present anti-tuberculosis work in the county and a campaign involving the examination of every resident.

C. A. Greenleaf, M.D., President of the Association, reviewed the record as did Lilla C. Wheeler of Portville, former member of the County Board of Health. Wendell R. Ames, M.D., Commissioner of Health, Richard Nauen, M.D., Director of Tuberculosis Control, and Dorothy V. Weston, member of the Cattaraugus County Board of Health, were other speakers. It was recalled that the Tuberculosis and Public Health Association was a participating agency in the health demonstration conducted

in the county for about ten years under the auspices of the Milbank Memorial Fund and the State Charities Aid Association.

#### FELLOWSHIPS IN PUBLIC HEALTH AVAILABLE TO VETERANS

The New York State Department of Health has available a limited number of fellowships for physicians desirous of equipping themselves with the necessary field and academic experience for the practice of civilian public health on a full-time basis. Six to twelve months of orientation and field work are provided under the guidance of experienced district state health officers, followed by an academic year at a postgraduate school of public health where the master's degree in public health is earned. Fellowship provisions are generous and include tuition. Those completing the training are professionally qualified for appointment on the staff of most local and state health departments.

Applicants must possess certain basic qualifications, among which are United States citizenship, graduation from a medical school approved by the American Medical Association, internship of at least one year's duration in a general hospital approved for internship by the American Medical Association, and eligibility for license to practise medicine in New York State. The upper age limit is 35 years.

Physicians interested in making application for a fellowship should write to the State Department of Health, Albany 1, N. Y.

#### EMPLOYMENT OF RETURNING VETERANS AND DISPLACED WAR WORKERS

Returning veterans and displaced war workers who are scientifically and professionally qualified and who are seeking employment in industry, non-profit research institutions, colleges, and universities are offered the resources of

the National Roster of Scientific and Specialized Personnel. The Roster is prepared to undertake placement in practically all professional fields except in elementary and high school teaching, and does not restrict its help to the fields in which it maintains its registry.

Technical and professional personnel are invited to notify the National Roster that they are available for employment. If any are not already registered with the Roster, registration blanks will be sent to them promptly on request. Employers who are in need of additional personnel should send to the Roster descriptions of the positions which they wish to fill, together with detailed requirements as to age, extent of education, and amount and nature of experience. Professional and technical societies that are engaged in organized efforts to place members of their professions are privileged to ask the co-operation of the National Roster.

Address: National Roster of Scientific and Specialized Personnel, 1006 U Street, N.W., Washington 25, D. C.

#### BALTIMORE'S DEMOGRAPHIC STUDIES

A broad concept of the demographic responsibility of a registration office is suggested by W. Thurber Fales, Sc.D., Director of the Statistical Section of the Baltimore City Health Department. In "Demographic Responsibilities of a Registration Office as Developed in Baltimore, Maryland," in the September-October, 1945, *Baltimore Health News*, he reminds health officers and vital statistics registrars that the statistical uses of vital records are even more important than the legal.

He relates the story of Baltimore's acceptance of its responsibility not alone for registering and reporting births and deaths, but for knowledge of its population characteristics and distribution as well. In 1935, the City Health Department reorganized the city's census tracts into 157 subdivisions,

each with a fairly homogeneous population of approximately 5,200 persons. All vital statistics, as well as census data, are now tabulated for these tracts, so that current social data in neighborhood units are at all times available.

He points out further some of the special departmental and coöperative uses to which resulting data have been put—deaths of veterans reported to the State Veterans Commission, of physicians to the A.M.A., accident deaths to the Traffic Bureau. Interdepartmental reports include births to the Bureau of Child Hygiene, maternal deaths to the Division of Maternity Hygiene, tuberculosis deaths to the Bureau of Tuberculosis, etc.

A further activity has been to furnish consultant service to other agencies in the preparation of studies based upon population and vital statistics. The list of studies and coöperating agencies is an impressive one.

Dr. Fales concludes:

The writer is firmly convinced that a recognition by registration offices of the three basic principles, that is a broad definition of vital statistics, the need for timely releases of current data, and the importance of analyses based on small areas, will give to registration offices a new impetus to explore their statistical opportunities. For all cities having a population of 250,000 or more there should be a vital statistics office with a program similar to that of Baltimore. . . . The same principles that form the basis of Baltimore's development of its vital statistics program are applicable to large jurisdictions. A state registration office should aim to be the center for demographic data for the entire state. Counties or subdivisions of counties may replace census tracts in its concept of small areas.

#### "BABY TALK" MAGAZINE ANNOUNCES HEALTH AWARDS

The magazine *Baby Talk*, marking its 10th anniversary in New York City in November, announced six awards for furthering health and welfare of mothers and babies. Among those re-

ceiving the recognition were Martha M. Eliot, M.D., Assistant Chief, U. S. Children's Bureau, Washington, D. C.; Leona Baumgartner, M.D., Director of the Bureau of Child Hygiene, New York City Department of Health; Hazel Corbin, R.N., Director of the Maternity Center Association, New York City; Mrs. Sidonie Matsner Gruenberg, Director of the Child Study Association of America, New York City; J. Norris Myers, Editor of Medicine and Public Health Division of the Macmillan Company, Publishers, New York; and Senator Claude Pepper, Washington, D. C.

#### NEW SCHOOL OF PUBLIC HEALTH IN BRAZIL

The Institute of Hygiene of the University of São Paulo, where a post-graduate course in public health and hygiene was given for several years, has now been transformed into a School of Public Health and Hygiene under the direction of Dr. Paula Souza, who holds a diploma of Doctor in Public Health from The Johns Hopkins University. This is the first university school of the kind to exist in this country. Drs. Borges Vieira, P. Egydio de Carvalho, Alcantara Machado, Alexandre Wancolle, Lucas Assumpção and Arthur A. Whitaker are professors at the new school. Dr. Paula Souza, still absent in the United States, has just served as a member of the delegation of Brazil at the World Security Conference of San Francisco.

#### UNRRA TO EXPAND PROGRAM IN U. S.-OCCUPIED GERMANY

UNRRA health officers have completed an expanded program of winter medical care for the remaining displaced persons in assembly centers in U. S.-occupied Germany, according to word received by the Washington Headquarters of the international relief and rehabilitation agency. Care will

include full-scale hospital and dispensary services and an extensive schedule of preventive medicine based on standard public health procedures. The work will go forward under the supervision of the Public Health Branch of U. S. Military Government. Approximately 500,000 displaced persons are said to be in the U. S.-occupied zone at the present time.

Anticipating a severe winter with critical fuel shortages in Germany, UNRRA doctors are immunizing the displaced persons for typhus, diphtheria, typhoid, and smallpox. Supplies of the sulfa drugs are being stocked for pneumonia. The possibility of typhoid with the spring thaws is also being met now by sanitation measures to check the disease at its sources.

The winter program, concentrating on organized services within the assembly centers, marks a change of emphasis from the work this summer when the medical program was devoted primarily to basic services for the millions of displaced persons enroute to their homelands in mass repatriation movements.

Lt. Col. David C. Elliott of Cincinnati, Chief UNRRA medical officer for the zone, states that while it is difficult to forecast accurately the winter health prospects of the displaced persons, reliance has been placed on established health service techniques of preparing in advance for the possibility of critical developments.

#### ALL ARMY PERSONNEL TO RECEIVE INFLUENZA INOCULATIONS

The Office of the Surgeon General, U. S. Army, has announced that all Army personnel have been ordered inoculated during the months of October and November with a new influenza vaccine as a preventive measure against influenza epidemics. The vaccine, according to the announcement, is made by injecting influenza virus into chick embryos, and is administered in

a single injection. The experimentation with the new vaccine was started early in 1943, but sufficient quantities for mass inoculation were not made available until the present year.

#### BLUE CROSS PRIVILEGES FOR DISCHARGED SERVICE MEN

The Associated Hospital Service of New York, through its President, Louis H. Pink, announced in October that service men who suspended their membership in the Blue Cross Plan may be reinstated after discharge without loss of former privileges. Former service men not formerly in the plan may join without filing a medical questionnaire, a privilege usually given only to those persons subscribing as a part of an employed group. These special privileges are limited to a period of 60 days after military discharge.

### PERSONALS

#### Central States

WILLIAM WORDEN BOLTON, M.D., of Chicago, Ill., has been appointed Assistant Director of the Bureau of Health Education, American Medical Association, Chicago, effective October 15. Dr. Bolton is a graduate in medicine from the Jefferson Medical College in 1930 and was formerly connected with the Pennsylvania State Department of Health in venereal disease control work. He recently has served with the U. S. Army Medical Corps in Germany.

D. A. DUKELOW, M.D.,\* who for 8 years has served as Director of Public Health Education in the Minnesota Department of Health, Minneapolis, on November 1 became Secretary to the Division of Health and Medical Care of the Central Planning and Research Department, Minneapolis Council of Social Agencies.

ALBERT C. EDWARDS, M.D.,\* Port

Huron, Mich., Director of the St. Clair County Health Department, has been named Health Officer of Racine, to succeed DR. IRA F. THOMPSON, who resigned.

ROBERT M. MAURER, M.D., of Brazil, Indiana, has been named Health Commissioner of Clay County to succeed LEWIS C. RENTSCHLER, M.D., Clay City, who resigned because of ill health.

CARL J. POTTHOFF, M.D.,† who for 8 years has been Associate Professor of Biological Sciences and Public Health at the University of Minnesota, has been appointed Director of First Aid and Associate Medical Director of the American Red Cross, Washington, D. C.

RUSSELL O. SALVIK, M.D., has been appointed Director of Maternal and Child Health for the North Dakota State Department of Health.

#### Eastern States

JOHN J. BOURKE, M.D., M.P.H.,\* who has recently been serving with the U. S. Public Health Service Reserve as Senior Surgeon, has been named the Director of the New York State Survey of Hospital Facilities for the Joint Hospital Board appointed by Governor Dewey. Dr. Bourke was formerly the Director of the State Legislative Health Preparedness Commission.

H. BRIEGER, M.D.,† of Philadelphia, has resigned from the staff of the Hahnemann Medical College and has been appointed Associate Professor of Preventive Medicine (in industrial hygiene and medicine) at Jefferson Medical College, Philadelphia.

DEAN A. CLARK, M.D.,† Assistant Director of the Public Health Methods Division and Senior Surgeon of the U. S. Public Health Service,

\* Fellow A.P.H.A.

† Member A.P.H.A.

has been granted a leave of absence to become Medical Director of the Health Insurance Plan of Greater New York.

GEORGE E. FOLEY,<sup>†</sup> Bacteriologist of the Department of Preventive Medicine and Epidemiology, Harvard Medical School and School of Public Health, has resigned as of November 1 to accept an appointment to the staff of the Massachusetts General Hospital, Boston, as Assistant Bacteriologist.

### Southern States

LUDWIK ANIGSTEIN, M.D.,<sup>†</sup> Associate Professor of Preventive Medicine of the Medical Branch at Galveston of the University of Texas, attended the first Inter-American Conference on Typhus Fever, held in Mexico City in October. He was invited to discuss the classification of rickettsia.

MRS. ENOLA ARCHINARD, M.A., M.S.W., was recently appointed Medical Social Supervisor for the New Orleans Health Department. Previous to this, she had been in charge of the Rehabilitation Program of the Council of Social Agencies and the Department of Public Welfare of New Orleans.

VINTON W. BACON,<sup>†</sup> Asst. Engr. (R) USPHS, is Supervisor of the combined Typhus Control and Typhus Training Project in Atlanta, in which the City of Atlanta, State Health Department and the U. S. Public Health Service are coöperating.

W. D. CAGLE, M.D.,<sup>†</sup> Regional Medical Officer, West Central Region at Griffin, Ga., has transferred headquarters to Marietta and will serve as Medical Director of the Northwestern and Northeastern Regions.

WILLIAM F. ELKIN,<sup>†</sup> who has recently served in the U. S. Bureau of the Census, Division of Vital Statistics, Washington, D. C., has resigned to accept the position of statistician in

the Oak Ridge, Tenn., Department of Health.

JAMES L. FIESER, Washington, D. C., long a senior staff member of the American National Red Cross, has resigned to accept an appointment as Assistant to the President of the National Safety Council, Inc., Chicago, Ill.

### CHANGES IN HEALTH OFFICERS IN FLORIDA

LELAND H. DAME, M.D.,<sup>†</sup> Director of Seminole County Health Department for the past 3 years has resigned and has been appointed Director of the Orange County Health Department with headquarters at Orlando, as of November 1, 1945.

JAMES B. PARRAMORE, M.D.,<sup>†</sup> after serving in the U. S. Public Health Service, has returned to Key West and has been appointed Director of the Monroe County Health Department, October 2. He was previously Director of this Unit.

WILLIAM P. RICE, M.D.,<sup>†</sup> has resigned as Director of the Orange County Health Unit and has entered medical practice at Orlando. He is specializing in pediatrics.

PAUL J. COUGHLIN, M.D., was recently appointed Director of the Leon County Health Department with headquarters at Tallahassee. He had been serving as Health Officer of the Unit on assignment from the Public Health Service.

ELBYRNE G. GILL, M.D., Roanoke, Va., was recently appointed Chairman of the City Board of Health and WILLIAM R. WHITMAN, M.D., Vice-chairman.

RALPH GREGG, M.D., Senior Surgeon, U. S. Public Health Service, has been assigned to the Kentucky State Health Department to serve as Field

\* Fellow A.P.H.A.

† Member A.P.H.A.

# American Journal of Public Health and THE NATION'S HEALTH

## Index of Volume 35, 1945

### *How to Use the INDEX*

This is an Index to all the reading matter in the JOURNAL. It is essentially a title and author Index, although occasional subject headings are provided.

Articles, committee reports, and editorials are listed alphabetically according to the key words in the title, with many cross-references.

Editorials are indexed under "Editorials" as well as alphabetically under the key words in the title.

News notes and fillers are indexed under "News from the Field." This section should be searched as supplemental to the title index.

Matters pertaining to the Association are indexed under "American Public Health Association."

Book reviews are indexed under "Books and Reports."

Obituaries are indexed under "Death Notices."

	Page
Accident Prevention—An Essential Public Health Service. Program Developed by Subcommittee on Accident Prevention, Committee on Administrative Practice, A.P.H.A. Donald B. Armstrong, M.D., Chairman.....	216
Accounting for Health Education, Report of the Committee on Problems in Cost. H. E. Kleinschmidt, M.D., Chairman.....	1075
Accreditation of Schools of Public Health. Editorial.....	953
Active Immunization with Purified Somatic Antigens of <i>Eberthella typhosa</i> , <i>Salmonella paratyphi</i> , and <i>Salmonella schottmuelleri</i> . Lt. Herbert R. Morgan, MC, AUS.....	614
Administration, Three "R's" of. Editorial.....	826
Administrative Practice, A Twenty-five Year Review of the Work of the Committee on. Wilton L. Halverson, M.D.....	1253
Administrative Practice, Committee on. See: Association Progress in 1944. Abel Wolman, Dr.Eng. . . . .	1
Adolescent. See: Physical Fitness and Health Problems of the Adolescent.	
Advertising for Health Education, Report of the Committee on Utilization of Commercial. David Resnick, Chairman.....	859
Agglutination with Absorbed Sera, Distribution of <i>Shigella</i> in India as Determined by Spot. John B. Nelson, Ph.D., Carl Tenbroeck, M.D., and Gustave J. Dammin, Major, MC . . . . .	1282
Air-borne Infections, Evaluation of Methods to Control. James E. Perkins, M.D. ....	891
Air-borne Infections in a Naval Training Center, Ultra-violet Light Control of. Preliminary Report. S. M. Wheeler, Lt. (MC) USNR, H. S. Ingraham, Lt. (MC) USNR, Alexander Hollaender, Ph.D., N. D. Lill, Lt. Comdr. (MC) USNR, J. Gershon-Cohen, Lt. Comdr. (MC) USNR, and E. W. Brown, Capt. (MC) USN.....	457
Air-borne Infection, The Problem of. Editorial.....	951
Air Sterilization, Epidemiologic Observations on the Use of Glycol Vapors for. Edward Big, M.D., B. H. Jennings, M.E., and F. C. W. Olson.....	788
Altenderfer, Marion E., and Davis, Burnet M., M.D. Effect of the War on the Distribution of Full-time Local Health Officers.....	1047
Aluminum vs. Silica. Editorial.....	736
Amebiasis in a Hospital for the Insane. William B. Birnkrant, M.D., Morris Greenberg, M.D., and Capt. Harry Most, MC, AUS.....	805
American Journal of Public Health. See: The Journal Is 35 Years Old. Reginald M. Atwater, M.D. . . . .	1305
American Journal of Public Health, The. Editorial.....	1319



	Page
American Public Health Association News..76, 179, 287, 420, 536, 659, 766, 875, 966, 1098, 1239,	1335
Administrative Practice, Committee on. See: Health Practice Indices, 1945.....	1099
Air-borne Infections, Appointment of Committee for the Evaluation of Methods to Control. James E. Perkins, M.D., Chairman.....	1338
American Journal of Public Health in France, The.....	662
Announcement of a Reporting Area for Health Practices.....	287
A.P.H.A. to Accredited Schools of Public Health.....	878
Appointment of Committee for the Evaluation of Methods to Control Air-borne Infections. James E. Perkins, M.D., Chairman.....	1338
Committee List, 1944-1945.....	388, 540
Control of Communicable Diseases, The. (6th Ed.).....	420
Evaluation of Local Health Service, Indicated State Health Department Participation in the Promotion of.....	537
Fellowship, Applications for.....	968, 1100
Fellowship Applications for 1945 Election, Closing Date for Accepting.....	510, 662
France, The American Journal of Public Health in.....	662
Health Conferences—1945 Pattern, State.....	536
Health Practice Indices, 1945.....	1099
Indicated State Health Department Participation in the Promotion of Evaluation of Local Health Service.....	537
Indices, Health Practice, 1945.....	1099
Local Health Service, Indicated State Health Department Participation in the Promotion of Evaluation of.....	537
Membership, Applications for.....76, 179, 288, 421, 537, 659, 766, 875, 967, 1098, 1239,	1337
Office of War Information. See: The American Journal of Public Health in France..	662
Palmer, Dr. George T., Commissioned.....	877
Perkins, James E., M.D., Chairman. Appointment of Committee for the Evaluation of Methods to Control Air-borne Infections.....	1338
Public Health Education Section, Committee List Addition.....	540
Public Health Meetings, State: 1945 Pattern.....	966
Reporting Area for Health Practices. See: Indicated State Health Department Participation in the Promotion of Evaluation of Local Health Service.....	537
Reporting Area for Health Practices, Announcement of a.....	287
Representatives of the American Public Health Association to Other Organizations and Committees for 1945.....	405
Schools of Public Health, A.P.H.A. to Accredited.....	878
Section Councils, 1944-1945.....	386
Standard Methods for the Examination of Water and Sewage. Summary of Recommended Changes for the Ninth Edition.....	1335
State Health Conferences—1945 Pattern.....	536
Statement of Financial Condition as of December 31, 1944.....	770
State Public Health Meetings: 1945 Pattern.....	966
Sustaining Members.....	420
Water and Sewage, Standard Methods for the Examination of. Summary of Recommended Changes for the Ninth Edition.....	1335
Annual Meeting Postponed, The 7th.....	276
Anthrax in the United States, 1939-1943. Report of the Committee on Industrial Anthrax. Henry Field Smyth, M.D., Dr.P.H., Chairman.....	850
Anthropometric Studies in the Field of Nutritional Research, Statistical Methods in. Rachel M. Jeness, Sc.D.....	1053
Antibacterial Agents, Report of the Committee on Examination of Germicides and. Stuart Mudd, M.D., Chairman.....	830
Antibiotic Agents. Selman A. Waksman, Associate Referee. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	830
Antityphoid Immunizing Substances, A Proposed Typhoid Immunogenic Unit for Evaluation of. Major George F. Luippold.....	153
Application of the Phosphatase Test to Cheese. I. A Preliminary Report on Cheddar Type Cheese. Harry Scharer.....	358
Applications of the Complement-Fixation Test in the Study of Rickettsial Diseases. Ida A. Bengtson, Ph.D.....	701
Appraisal of a National Program for Medical Care, An. (After Ample Opportunity to Study the Proposals.) W. G. Smilie, M.D.....	587
Appraisal of Public Health Work, Next Steps in the. Wilton L. Halverson, M.D.....	8
Arbana, Guillermo, M.D., M.P.H., and Morales-Otero, Pablo, M.D. Difficulties in Planning Public Health Programs in Tropical Areas.....	1057
Archivist—1944, Report of the. Anna M. Sexton.....	849
Armed Forces, Tuberculosis in the. Col. Esmond R. Long, MC, and Major Edward A. Lew, MAC.....	469
Armstrong, Donald B., M.D., Chairman, Subcommittee on Accident Prevention. Program Developed by.....	216
Army. See: Armed Forces.	
Army's Experience with 8,000,000 Men, The. Does Health Education Prevent Venereal Disease? Capt. Granville W. Larimore and Lt. Col. Thomas H. Sternberg.....	709
Army Water Quality Control, Factors in. W. A. Hardenbergh, Colonel, Sn.C.....	361
Army Water Supplies in Foreign Areas. Captain James B. Baty, Sn.C.....	347

	Page
Arthropod-borne Virus Encephalitides, Recent Advances in the Epidemiology of the. Including Certain Exotic Types. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994
Association History. See:	
The Journal Is 35 Years Old. Reginald M. Atwater, M.D. . . . .	1305
The American Journal of Public Health. Editorial. . . . .	1319
Association Impacts—Past and Present. Landmarks of 1944. Louis I. Dublin, Ph.D. . . . .	22
Association Progress in 1944. Landmarks of 1944. Abel Wolman, Dr.Eng. . . . .	1
Atmospheric Pollution Nuisances, Study and Control of Industrial. Frank M. Stend. . . . .	491
Atwater, Reginald M., M.D. The Journal Is 35 Years Old. . . . .	1305
Azimuthal Equidistant Projection in Maps of Disease, Equal-area Projections and the. Saul Jarcho, Major, MC. . . . .	1005

## B

Background of Current Trends in the Relation of Public Health to Medical Care. Milton Terris, M.D., M.P.H. . . . .	1287
Back-siphonage Connections Under War Conditions, Cross-Connections and. Sanitary Engineering Report 8, National Research Council. . . . .	637
Bacteria "Count," The—An Estimate Capable of Accurate Interpretation. James D. Brew, Ph.D., and Robert S. Breed, Ph. D. (Followed by Discussion by Robert S. Breed, Ph.D.) . . . . .	683
Bacteriological Improvements Obtained by the Practice of Break-Point Chlorination. A. E. Griffin, Ph.B., and N. S. Chamberlin. . . . .	199
Baltimore. See Sickness as an Index of the Need for Health Supervision of the School Child. Jean Downes . . . . .	593
Baltimore the Oldest Health Department? Has. Editorial. . . . .	49
Barden-Lafollette amendment (Public Law 113). See: Industrial Hygiene and the Expanded Federal-State Vocational Rehabilitation Program. Dean A. Clark, Senior Surgeon (R), USPHS. . . . .	504
Barnes, M. E., M.D., Dr.P.H. A Public Health Role for the Laundry. . . . .	1277
Basic Essentials of Milk Sanitation. Editorial. . . . .	50
Baty, Captain James B., Sn.C. Army Water Supplies in Foreign Areas. . . . .	347
Baumgartner, Leona, M.D., Ph.D., Goode, Harry H., B.Ch.E., and Kantrow, Abraham H., M.D. Service Records and Their Administrative Uses. Experience from a School Health Service . . . . .	1063
Beagler, A. L., M.D., Wedum, Bernice G., M.D., and Wedum, Arnold G., Ph.D., M.D. Prevalence of Rheumatic Heart Disease in Denver School Children. . . . .	1271
Bedbug Control. See: Insect Problems in World War II with Special References to the Insecticide DDT. F. C. Bishopp. . . . .	373
Bell, E. John, Capt., Sn.C., AUS, Blake, Francis G., M.D., Maxey, Kenneth F., M.D., Dr.P.H., Sadusk, Joseph F., Jr., Col., MC, AUS, and Kohls Glen M., Major, Sn.C., AUS. Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. . . . .	1121
Bellows, Marjorie T., and Wegman, Myron E., M.D. Indices and Standards for Child Health Services . . . . .	715
Bengtson, Ida A., Ph.D. Applications of the Complement-Fixation Test in the Study of Rickettsial Diseases . . . . .	701
Bessey, Otto A., Ph.D., and Lowry, Oliver H., Ph.D., M.D. Biochemical Methods in Nutritional Surveys . . . . .	941
$\beta$ -Hemolytic Streptococci in Common Respiratory Disease, Role of. Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Presented by Capt. Elias Strauss, M.C. . . . .	675
Bigg, Edward, M.D., Jennings, B. H., M.E., and Olson, F. C. W. Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization. . . . .	788
Biochemical Methods in Nutritional Surveys. Otto A. Bessey, Ph.D., and Oliver H. Lowry, Ph.D., M.D. . . . .	941
Birnkrant, William B., M.D., Greenberg, Morris, M.D., and Most, Capt. Harry, MC, AUS. Amebiasis in a Hospital for the Insane. . . . .	805
Birnkrant, William B., M.D., Schiffner, Joseph J., and Greenberg, Morris, M.D. Outbreak of Sodium Nitrite Poisoning. . . . .	1217
Birth, Infant Mortality in Relation to Month of. Paris R. Eastman. . . . .	913
Birth Rate—A Brief Historical Summary, War and the. Louis I. Dublin, Ph.D. . . . .	315
Birth Rate on Future Population, Effect of Increased. P. K. Whelpton. . . . .	326
Birth Rate on Maternal and Child Health Problems, Effect of the Increased. John M. Saunders, M.D. . . . .	140
Birth Rate, Recent Trend of the. A. W. Hedrich, Sc.D. . . . .	321
Births and the Newspapers. Safeguard Adopted by the New York State Department of Health Against Indiscriminate Publicity. J. V. DePorte, Ph.D. . . . .	341
Bishopp, F. C. Insect Problems in World War II with Special References to the Insecticide DDT . . . . .	373
Blake, Francis G., M.D., Maxey, Kenneth F., M.D., Dr.P.H., Sadusk, Joseph F., Jr., Col., MC, AUS, Kohls, Glen M., Major, Sn.C., AUS, and Bell, E. John, Capt., Sn.C., AUS. Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. . . . .	1121
Blood Distribution Program, New York State Plans. . . . .	346
Blood Plasma. See: Gamma Globulin for Measles. Editorial. . . . .	732
Bloomfield, J. J. Industrial Health Records: The Industrial Hygiene Survey. . . . .	559

	Page
<b>Books and Reports.....</b>	<b>65, 165, 277, 407, 524, 650, 759, 866, 959, 1087, 1228, 1325</b>
Acherknecht, Erwin H. <i>Malaria in the Upper Mississippi Valley 1760-1900. Supplement No. 4 to the Bulletin of the History of Medicine.....</i>	961
Aerobic, Non-sporing, Excretal Bacteria. Arthur Compton.....	411
American Medical Practice in the Perspectives of a Century. Bernhard J. Stern.....	654
American Philosophical Society. Symposium on Wartime Advances in Medicine.....	277
American Psychiatric Association. One Hundred Years of American Psychiatry.....	170
A.P.H.A., Committee on the Hygiene of Housing. An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method.....	866
A.P.H.A., Compiled by the Vital Statistics Section of the. Vital Statistics Directory (3rd ed.).....	960
A.P.H.A. Diagnostic Procedures and Reagents. Technics for the Laboratory Diagnosis and Control of Communicable Diseases (2nd ed.).....	1087
A.P.H.A., Report prepared by the Subcommittee on Chemical Methods of the Committee on Ventilation and Atmospheric Pollution of the Industrial Hygiene Section of the. Methods for Determining Lead in Air and in Biological Materials.....	1230
A.P.H.A. Spanish Summary of the 8th edition (1941) Standard Methods for the Examination of Dairy Products.....	650
American Public Works Association Public Works Engineers' Yearbook, 1944.....	71
American Social Hygiene Association. Proceedings of the Puerto Rico Regional Conference on Social Hygiene.....	166
Analytical Chemistry of Industrial Poisons, Hazards and Solvents. Vol. 1 (2nd ed.). Morris B. Jacobs.....	167
Anderson, Camilla M. Emotional Hygiene.....	527
And Now to Live Again. Betsey Barton.....	410
Animal Colony Maintenance. Edmond J. Farris et al.....	1229
Appel, Kenneth E., and Strecker, Edward A. Psychiatry in Modern Warfare.....	1328
Appleton, J. L. T. Bacterial Infection, with Special Reference to Dental Practice (3rd ed.).....	1091
Appraisal Method for Measuring the Quality of Housing, An: A Yardstick for Health Officers, Housing Officials and Planners. Part I. Nature and Uses of the Method. Committee on the Hygiene of Housing, A.P.H.A.....	866
Approved Laboratory Technic (4th ed.). John A. Kolmer and Fred Boerner.....	761
Artificial Pneumothorax in Pulmonary Tuberculosis. Including Its Relationship to the Broader Aspects of Collapse Therapy. T. N. Rafferty.....	65
Attendant's Guide, The. Edith M. Stern in collaboration with Mary D. Corcoran....	960
Autobiography of Science, The. Edited by Forest Ray Moulton and Justis J. Schifferes.....	1090
Baby Care During Expectancy and the First Year. (2nd ed. rev.). May H. Law.....	282
Baby Manual, The. Herman N. Bundesen.....	171
Bacterial Cell, The. René J. Dubos.....	1325
Bacterial Infection, with Special Reference to Dental Practice (3rd ed.). J. L. T. Appleton.....	1091
Bacteriology and Allied Subjects. Louis Gershenfeld.....	759
Baitsell, George A., Edited by. Science in Progress (4th series).....	962
Barton, Betsey. And Now to Live Again.....	410
Basic Plan for Health Education and the School Health Program, A. Prepared by the Illinois Joint Committee on School Health.....	415
Basic Plan for Student Health and Health Education in Teacher Training Institutions, A. Prepared by the Illinois Joint Committee on School Health.....	415
Bauer, Julius. Constitution and Disease. Applied Constitutional Pathology (2nd ed.)..	1234
Beardwood, J. T., Jr., and Kelly, H. T. Simplified Diabetic Management.....	69
Behavior Changes Resulting from a Study of Communicable Diseases. John Urban..	72
Bellows, Marjorie T., Drolet, Godias J., and Goode, Harry, Compiled by. Handbook. Statistical Reference Data by District and Health Area. 1931-1940.....	650
Bethea, Oscar W. (Edited by). Year Book of General Therapeutics, 1943.....	65
Bibliographie d'Hygiene Industrielle. Vol. XIV. International Labour Office.....	410
Binger, Carl. The Doctor's Job.....	1328
Bispham, William H., Malaria: Its Diagnosis, Treatment and Prophylaxis.....	166
Boerner, Fred, and Kolmer, John A. Approved Laboratory Technic (4th ed.).....	761
Bolduan, Charles Frederick, and Bolduan, Nils William. Translated by Clare H. de Kirk. Hygiene y Salud Publica. (3rd ed. rev.).....	866
Borderlands of Psychiatry. Stanley Cobb.....	414
Breckenridge, Marian E., and Vincent, E. Lee. Child Development, Physical and Psychological Growth Through the School Years.....	278
Brown, Amy Frances. Medical Nursing.....	1228
Brown, James M., and Judson, Harry H. Occupational Accident Prevention.....	870
Bundesen, Herman N. The Baby Manual.....	171
Burnett, R. Will. To Live in Health.....	281
By Order of the Surgeon General. Samuel B. Grubbs.....	279
Byrd, Oliver E. Health Instruction Yearbook, 1944.....	279
Byrd, Oliver E., Compiled by. The Health Instruction Yearbook, 1945.....	1327

Books and Reports—Continued	Page
California Mosquito Control Association, Proceedings and Papers of the Thirteenth Annual Conference of the. Edited by Harold Farnsworth Gray.....	280
Cantarow, Abraham and Trumper, Max. Lead Poisoning.....	524
Carman, Mabel C., and Davis, M. Edward. DeLee's Obstetrics for Nurses (13th ed.)..	172
Carrington, William J. Safe Convoy.....	173
Castiglioni. See: Essays in the History of Medicine Presented to Professor Arturo Castiglioni on the Occasion of His Seventieth Birthday, April 10, 1944.....	653
Cavins, Harold M. National Health Agencies—A Survey with Especial Reference to Voluntary Associations, including a Detailed Directory of Major Health Organizations .....	1093
Chandler, Asa C. Introduction to Parasitology, With Special Reference to the Parasites of Man (7th ed.).....	761
Child Development. Physical and Psychological Growth Through the School Years. Marian E. Brackenridge and E. Lee Vincent.....	278
Children's Bureau Publication No. 302. Community Health and Welfare Expenditures in Wartime, 1942 and 1940—30 Urban Areas.....	70
Chirico, Frank N. Industrial Health Engineering in the Tunneling Operations of the Tennessee Valley Authority.....	1326
Clark, et al. Mass Miniature Radiography of Civilians.....	759
Clinical Practice in Infectious Diseases for Students, Practitioners and Medical Officers. (2nd ed.) E. H. R. Harries and M. Milman, with a foreword by W. Allen Daley .....	412
Cobb, Stanley. Borderlands of Psychiatry.....	414
Community Health and Welfare Expenditures in Wartime, 1942 and 1940—30 Urban Areas—Children's Bureau Publication No. 302.....	70
Community Service Society, Department of Educational Nursing. Family Health Service in Tuberculosis.....	529
Compton, Arthur. Aerobic, Non-sporing, Excretal Bacteria.....	411
Conant, N. F., et al. Manual of Clinical Mycology.....	1091
Constitution and Disease: Applied Constitutional Pathology. (2nd ed.) Julius Bauer .....	1234
Cook, Margaret G., Edited by. Helmers, Lili, Compiled by. Health Education for All Ages .....	281
Corcoran, Mary E., in collaboration with Stern, Edith M. The Attendants Guide.....	960
Corwin, E. H. L., and Cunningham, Elizabeth V. Institutional Facilities for the Treatment of Alcoholism.....	167
Craig, Charles Franklin. The Etiology, Diagnosis, and Treatment of Amebiasis.....	526
Crutcher, Hester B. Foster Home Care for Mental Patients.....	528
Cunningham, Elizabeth V., and Corwin, E. H. L. Institutional Facilities for the Treatment of Alcoholism.....	167
Dampier, Sir William Cecil. A Shorter History of Science.....	165
Davis, Maxine. Woman's Medical Problems.....	1330
Davis, M. Edward, and Carman, Mabel C. DeLee's Obstetrics for Nurses (13th ed.)..	172
DDT, A Digest of the Literature on. R. C. Roark and N. E. McIndoo.....	408
de Kirk, Clare H., Translated by. Bolduan, Charles Frederick and Bolduan, Nils William. Higiene y Salud Publica (3rd ed. rev.).....	869
DeLee's Obstetrics for Nurses (13th ed.). M. Edward Davis and Mabel C. Carman..	172
Demographic Studies of Selected Areas of Rapid Growth. Milbank Memorial Fund..	526
Diagnostic Procedures and Reagents. Technics for the Laboratory Diagnosis and Control of Communicable Diseases (2nd ed.). A.P.H.A.....	1087
Diehl, Harold S. Textbook of Healthful Living (3rd ed.).....	1059
Digest of the Literature on DDT, A. R. C. Roark and N. E. McIndoo.....	408
Directory of Social Agencies in the City of New York, 1944-45. Committee on Information Services of the Welfare Council.....	762
Disinfection and Sterilization (2nd ed.). Ernest C. McCulloch.....	1232
Doctors at War. Edited by Morris Fishbein.....	960
Doctor's Job, The. Carl Binger.....	1328
Doherty, J. Kenneth. Solving Camp Behavior Problems.....	1329
Drolet, Godias J., Goode, Harry, and Bellows, Marjorie T., Compiled by. Handbook. Statistical Reference Data by District and Health Area. 1931-1940.....	650
Dubos, René J. The Bacterial Cell.....	1325
Edge, P. Granville. Vital Statistics and Public Health Work in the Tropics.....	168
Emerson, Haven, with the collaboration of Luginbuhl, Martha. Local Health Units for the Nation.....	1087
Emotional Hygiene. Camilla M. Anderson.....	527
Employment Opportunities in Public Health. Committee on Professional Education of the A.P.H.A. and the U.S.P.H.S.....	524
Engineering Preview. (Home Study Edition.) L. E. Grinter, et al.....	1093
Enrichment of Flour and Bread. Russell M. Wilder and Robert R. Williams.....	525
Eshleman, Fannie, and Hetherington. H. W. Nursing in Prevention and Control of Tuberculosis (rev. ed.).....	869
Essays in the History of Medicine Presented to Professor Arturo Castiglioni on the Occasion of His Seventieth Birthday, April 10, 1944.....	653
Essentials of Body Mechanics in Health and Disease (4th ed. rev.). Joel E. Goldthwait, et al. ....	1092
Etiology, Diagnosis, and Treatment of Amebiasis, The. Charles Franklin Craig....	526

Books and Reports—Continued

Page

Family Health Service in Tuberculosis. Community Service Society, Department of Educational Nursing . . . . .	529
Family Susceptibility to Tuberculosis. Ruth R. Puffer.....	655
Farris, Edmond J., et al. Animal Colony Maintenance.....	1229
Fishbein, Morris, Edited by. Doctors at War.....	960
Fishbein, Morris, and Irwin, Leslie W. Health and First Aid.....	66
Fluorine in Dental Public Health. A Symposium by Frederick S. McKay, et al.....	1230
Food for the World. Edited by Theodore W. Schultz.....	1327
Food Regulation and Compliance. Vol. I. Arthur D. Herrick.....	528
Forty-third Year Book of the National Society for the Study of Education. Part I. Adolescence—Distributed by the Dept. of Education, University of Chicago.....	169
Foster Home Care for Mental Patients. Hester B. Crutcher.....	528
Foster, Robert G. Marriage and Family Relationships.....	652
Freeman, Ruth B. Techniques of Supervision in Public Health Nursing.....	67
French, Herbert, Edited by. An Index of Differential Diagnosis of Main Symptoms. (6th ed.) . . . . .	1092
Frobisher, Martin, Jr. Fundamentals of Bacteriology. (3rd ed.).....	527
Fundamentals of Bacteriology. (3rd ed.) Martin Frobisher, Jr.....	527
Fundamentals of Internal Medicine. (2nd ed.) Wallace Mason Yater.....	525
Gershenfeld, Louis. Bacteriology and Allied Subjects.....	759
Gesell, Arnold. How a Baby Grows.....	1325
Gilbreth, Lillian M., in collaboration with Yost, Edna. Normal Lives for the Disabled... ..	416
Global Epidemiology: A Geography of Disease and Sanitation. Simmons, Wayne, Anderson, and Horack.....	529
Goetzl, Alfred, and Reynolds, Ralph Arthur. Julius Tandler. A Biography.....	73
Goldmann, Franz. Public Medical Care.....	1329
Goldstein, Sidney B. Marriage and Family Counseling.....	1330
Goldthwait, Joel E., et al. Essentials of Body Mechanics in Health and Disease (4th ed. rev.) . . . . .	1092
Goode, Harry, Bellows, Marjorie T., and Drolet, Godlas J., Compiled by. Handbook. Statistical Reference Data by District and Health Area. 1931-1940.....	650
Gould, Sylvester E. Trichinosis.....	409
Gray, Harold F., and Herms, William B. Mosquito Control—Practical Methods for Abatement of Disease Vectors and Pests.....	278
Gray, Harold Farnsworth, Edited by. Proceedings and Papers of the Thirteenth Annual Conference of the California Mosquito Control Association.....	280
Gregg, A. L. Tropical Nursing. A Handbook for Nurses and Others Going Abroad. (2nd ed.) . . . . .	170
Grinker, Roy R., and Spiegel, John P. Men Under Stress.....	1229
Grinter, L. E., et al. Engineering Preview. (Home Study Edition.).....	1093
Groves, Ernest R., and Groves, Gladys Hongland. Sex in Marriage. (3rd ed.).....	413
Grubbs, Samuel B. By Order of the Surgeon General.....	279
Gunn, Selskar M., and Platt, Philip S. Voluntary Health Agencies.....	1234
See. Editorial . . . . .	1070
Gunther, Carl E. M. Practical Malaria Control—A Handbook for Field Workers.....	173
Handbook of Industrial Psychology, The. May Smith.....	651
Handbook of Nursing in Industry. M. Gray Macdonald.....	69
Handbook of Practical Bacteriology (7th ed.) T. J. Mackie and J. E. McCartney.....	1232
Handbook. Statistical Reference Data by District and Health Area. 1931-1940. Compiled by Marjorie T. Bellows, Godlas J. Drolet, and Harry Goode.....	650
Harries, E. H. R., and Mitman, M., with a foreword by W. Allen Daley. Clinical Practice in Infectious Diseases for Students, Practitioners and Medical Officers. (2nd ed.) . . . . .	412
Headlee, Thomas J. The Mosquitoes of New Jersey and Their Control.....	1094
Health and First Aid. Morris Fishbein and Leslie W. Irwin.....	66
Health Counseling for Girls. Margaret L. Leonard.....	72
Health Education for All Ages. Compiled by Lili Helmers and edited by Margaret G. Cook . . . . .	281
Health Instruction Yearbook, 1944. Oliver E. Byrd.....	279
Health Instruction Yearbook, 1945, The. Compiled by Oliver E. Byrd.....	1327
Health Practice Indices. Subcommittee on Manual of Practice and Appraisal of Local Health Work for the Committee on Administrative Practice of the A.P.H.A. . . . .	277
Health Text-Workbook, An Orientation Course in Personal, Racial, Home and Community Hygiene. (4th ed. rev.) Kathleen Wilkinson Wooten.....	1326
Helmers, Lili, Compiled by. Cook, Margaret G., Edited by. Health Education for All Ages . . . . .	281
Herms, William B., and Gray, Harold F. Mosquito Control—Practical Methods for Abatement of Disease Vectors and Pests.....	278
Herrick, Arthur D. Food Regulation and Compliance, Vol. I.....	528
Hetherington, H. W., and Eshleman, Fannie. Nursing in Prevention and Control of Tuberculosis (rev. ed.).....	869
Higiene y Salud Publica (3rd ed. rev.). Charles Frederick Bolduan and Nils William Bolduan. Translated by Clare H. de Kirk.....	860

Books and Reports—Continued	Page
Hilleboe, Herman E., and Morgan, Russell H. Mass Radiography of the Chest.....	868
Housing for the United States After the War. (2nd ed.) National Association of Housing Officials.....	1231
Housing Yearbook. National Association of Housing Officials.....	414
How a Baby Grows. Arnold Gesell.....	1325
Hunter, George W., Worth, C. Brooke, and Mackie, Thomas T. Manual of Tropical Medicine.....	959
Illinois Joint Committee on School Health, Prepared by. A Basic Plan for Health Education and the School Health Program.....	415
Illinois Joint Committee on School Health, Prepared by. A Basic Plan for Student Health and Health Education in Teacher Training Institutions.....	415
Index of Differential Diagnosis of Main Symptoms, An. (6th ed.) Edited by Herbert French.....	1092
Industrial Health Engineering in the Tunneling Operations of the Tennessee Valley Authority. Frank N. Chirico.....	1326
Institutional Facilities for the Treatment of Alcoholism. E. H. L. Corwin and Elizabeth V. Cunningham.....	167
International Labour Office. Bibliographie d'Hygiene Industrielle.....	410
Introduction to Parasitology, With Special Reference to the Parasites of Man (7th ed.). Asa C. Chandler.....	761
Invitation to Health, a Guide to Successful Living. Harry J. Johnson.....	171
Irwin, Leslie W., and Fishbein, Morris. Health and First Aid.....	66
Jacobs, Morris B. The Analytical Chemistry of Industrial Poisons, Hazards and Solvents. Vol 1. (2nd ed.).....	167
Jensen, L. B. Microbiology of Meats.....	65
Jobs for the Physically Handicapped. Louis Neuschutz.....	416
Johnson, Harry J. Invitation to Health, a Guide to Successful Living.....	171
Judson, Harry H., and Brown, James M. Occupational Accident Prevention.....	870
Jurisprudence for Nurses (3rd ed.). Carl Scheffel, in collaboration with Eleanor McGarvah.....	1231
Kaempffert, Waldemar. Science Today and Tomorrow. (2nd series.).....	962
Kaltenbach, Winifred, and Lyon, Robert A., Revised by. Mitchell's Pediatrics and Pediatric Nursing (2nd ed. rev.).....	411
Kelly, H. T., and Beardwood, J. T., Jr. Simplified Diabetic Management.....	69
Kolmer, John A., and Boerner, Fred. Approved Laboratory Technic (4th ed.).....	761
Kurtz, Russell H., Edited by. Social Work Year Book 1945. (8th ed.).....	1094
Lambert, Clara. School's Out. Child Care Through Play Schools.....	762
Law, May E. Baby Care During Expectancy and the First Year (2nd ed. rev.).....	282
Lead Poisoning. Abraham Cantarow and Max Trumper.....	524
Leonard, Margaret L. Health Counseling for Girls.....	72
Levy, David M. Maternal Overprotection.....	282
Linder, Robert M. Rebel Without a Cause.....	172
Local Health Units for the Nation. Haven Emerson with the collaboration of Martha Luginbuhl.....	1087
Luginbuhl, Martha, in collaboration with Emerson, Haven. Local Health Units for the Nation.....	1087
Lyon, Robert A., and Kaltenbach, Winifred, Revised by. Mitchell's Pediatrics and Pediatric Nursing (2nd ed. rev.).....	411
Macdonald, M. Gray. Handbook of Nursing in Industry.....	69
Mackie, T. J., and McCartney, J. E. Handbook of Practical Bacteriology (7th ed.).....	1232
Mackie, Thomas T., Hunter, George W., and Worth, C. Brooke. Manual of Tropical Medicine.....	959
Maisel, Albert Q. The Wounded Get Back.....	416
Malaria in the Upper Mississippi Valley, 1760-1900. Supplement No. 4 to the Bulletin of the History of Medicine. Erwin H. Acherknecht.....	961
Malaria: Its Diagnosis, Treatment and Prophylaxis. William H. Bispham.....	166
Manual of Clinical Mycology. N. F. Conant, et al.....	1091
Manual of the Aspergilli, A. Charles Thom and Kenneth B. Raper.....	1228
Manual of Tropical Medicine. Thomas T. Mackie, George W. Hunter, and C. Brooke Worth.....	959
March of Medicine, Lectures to the Laity, 1944, The. New York Academy of Medicine..	760
Marihuana Problem in the City of New York, The. By The Mayor's Committee on Marihuana.....	652
Marriage and Family Counseling. Sidney E. Goldstein.....	1330
Marriage and Family Relationships. Robert G. Foster.....	652
Mass Miniature Radiography of Civilians. Clark, et al.....	759
Mass Radiography of the Chest. Herman E. Hilleboe and Russell H. Morgan.....	868
Maternal Overprotection. David M. Levy.....	282
Mayor's Committee on Marihuana. The Marihuana Problem in the City of New York..	652
McCartney, J. E., and Mackie, T. J. Handbook of Practical Bacteriology (7th ed.)..	1232
McCulloch, Ernest C. Disinfection and Sterilization (2nd ed.).....	1232
McGarvah, Eleanor, in collaboration with Scheffel, Carl. Jurisprudence for Nurses (3rd ed.).....	1231
McIndoo, N. E., and Roark, R. C. A Digest of the Literature on DDT.....	408

Books and Reports—Continued	Page
McKay, Frederick S., et al., A Symposium by. Florine in Dental Public Health.....	1230
Medical Care and Health Services for Rural People. Report of the National Rural Health Conference in April, 1914.....	1089
Medical Nursing. Amy Frances Brown.....	1228
Megaw, Sir John W. D., and Rogers, Sir Leonard. Tropical Medicine (5th ed.).....	959
Men Under Stress. Roy R. Glinker and John P. Spiegel.....	1229
Meredith, Howard V. Physical Growth from Birth to Two Years: I. Stature. A Review and Synthesis of North American Research for the Period 1850-1911.....	869
Methods for Determining Lead in Air and in Biological Materials. Report prepared by the Subcommittee on Chemical Methods of the Committee on Ventilation and Atmospheric Pollution of the Industrial Hygiene Section of the A.P.H.A.....	1230
Metodos Tipo Para El Examen De Los Productos De Lecheria. Summario de la Octava edicion norteamericana, 1915.....	650
Microbial Antagonisms and Antibiotic Substances. Selman A. Waksman.....	868
Microbiology of Foods, The. (2nd ed.) Fred Wilbur Tanner.....	71
Microbiology of Meats. L. B. Jensen.....	65
Milbank Memorial Fund. Demographic Studies of Selected Areas of Rapid Growth....	526
Mitchell's Pediatrics and Pediatric Nursing. (2nd ed. rev.) Revised by Robert A. Lyon and Winifred Kaltenbach.....	411
Mitman, M., and Harries, E. H. R., with a foreword by W. Allen Daley. Clinical Practice in Infectious Diseases for Students, Practitioners and Medical Officers. (2nd ed.).....	412
Morgan, Russel H., and Hilleboe, Herman E. Mass Radiography of the Chest.....	868
Mosquito Control—Practical Methods for Abatement of Disease Vectors and Pests. William B. Herms and Harold P. Gray.....	278
Mosquitoes of New Jersey and Their Control, The. Thomas J. Headlee.....	1094
Moulton, Forest Ray, and Schifferes, Justus J., Edited by. The Autobiography of Science.....	1090
Municipal Year Book, The, 1915. The Authoritative Résumé of Activities and Statistical Data of American Cities. (12th ed.) Clarence E. Ridley and Orin F. Nolting.....	1090
National Association of Housing Officials. Housing for the United States After the War (2nd ed.).....	1231
National Association of Housing Officials. Housing Yearbook.....	414
National Health Agencies—A Survey with Especial Reference to Voluntary Associations, including a Detailed Directory of Major Health Organizations. Harold M. Cavin.....	1093
National Rural Health Conference in April, 1914, Report of the. Medical Care and Health Services for Rural People.....	1089
National Tuberculosis Association, Medical Research Committee. Tuberculosis in the United States, Graphic Presentation, Vol. 2.....	867
Neuschutz, Louis. Jobs for the Physically Handicapped.....	416
New York Academy of Medicine. The March of Medicine, Lectures to the Laity, 1914..	760
Nolting, Orin F., and Ridley, Clarence E. The Municipal Year Book, 1915. The Authoritative Résumé of Activities and Statistical Data of American Cities. (12th ed.).....	1090
Normal Lives for the Disabled. Edna Yost, in collaboration with Lillian M. Gilbreth.....	416
Nursing for Community Health. Theda L. Waterman.....	168
Nursing in Prevention and Control of Tuberculosis (rev. ed.). H. W. Hetherington and Fannie Eshleman.....	869
Occupational Accident Prevention. Harry H. Judson and James M. Brown.....	870
One Hundred Years of American Psychiatry. American Psychiatric Association.....	170
Outline of Tropical Medicine, An. Otto Saphir.....	526
Pathogenesis of Tuberculosis, The. Arnold R. Rich.....	70
Phelps, Earle B. Stream Sanitation.....	409
Physical Growth from Birth to Two Years: I. Stature. A Review and Synthesis of North American Research for the Period 1850-1911. Howard V. Meredith.....	869
Pinner, Max. Pulmonary Tuberculosis in the Adult.....	1233
Platt, Philip S., and Gunn, Selskar M. Voluntary Health Agencies.....	1234
See: Editorial.....	1070
Postwar Planning in the United States: An Organization Directory. Twentieth Century Fund.....	411
Practical Malaria Control—A Handbook for Field Workers. Carl E. M. Gunther.....	173
Pratt, George K. Soldier to Civilian—Problems of Readjustment.....	651
Proceedings and Papers of the Thirteenth Annual Conference of the California Mosquito Control Association. Edited by Harold Farnsworth Gray.....	280
Proceedings of the Puerto Rico Regional Conference on Social Hygiene. American Social Hygiene Association.....	166
Professional Education of the A.P.H.A., Committee on, and U.S.P.H.S. Employment Opportunities in Public Health.....	524
Psychiatry in Modern Warfare. Edward A. Strecker and Kenneth E. Appel.....	1328
Public Health Nurse in the Community, The. Clara B. Rue.....	67

## Books and Reports—Continued

	Page
Public Medical Care. Franz Goldmann.....	1320
Public Works Engineers' Yearbook—1944. American Public Works Association.....	71
Puffer, Ruth R. Family Susceptibility to Tuberculosis.....	655
Pulmonary Tuberculosis in the Adult. Max Pinner.....	1233
Quarterly Journal of Studies on Alcohol. Studies on Alcohol; Lay Supplements Nos. 10, 11, and 12. The Drinker and the Drunkard, How Alcohol Affects Psychological Behavior, The Rehabilitation of Inebriates.....	654
Rafferty, T. N. Artificial Pneumothorax in Pulmonary Tuberculosis. Including Its Relationship to the Broader Aspects of Collapse Therapy.....	65
Raper, Kenneth B., and Thom, Charles. A Manual of the Aspergilli.....	1228
Ratcliff, John D., Edited by. Science Year Book of 1945.....	962
Rebel Without a Cause. Robert M. Lindner.....	172
Reynolds, Ralph Arthur, and Goetzl, Alfred. Julius Tandler. A Biography.....	73
Rich, Arnold R. Pathogenesis of Tuberculosis, The.....	70
Ridley, Clarence E., and Nolting, Orin F. The Municipal Year Book, 1945. The Authoritative Résumé of Activities and Statistical Data of American Cities. (12th ed.) .....	1090
Roark, R. C., and McIndoo, N. E. A Digest of the Literature on DDT.....	408
Rogers, Sir Leonard, and Megaw, Sir John W. D. Tropical Medicine (5th ed.).....	959
Rosenberg, B. D. Special Delivery.....	165
Rue, Clara B. The Public Health Nurse in the Community.....	67
Safe Convoy. William J. Carrington.....	173
Saphir, Otto. An Outline of Tropical Medicine.....	526
Scheffel, Carl, in collaboration with McGarvah, Eleanor. Jurisprudence for Nurses (3rd ed.) .....	1231
Schiffers, Justus J., and Moulton, Forest Ray, Edited by. The Autobiography of Science .....	1090
School's Out. Child Care Through Play Schools. Clara Lambert.....	762
Schultz, Theodore W., Edited by. Food for the World.....	1327
Science in Progress (4th series). Edited by George A. Baitsell.....	962
Science Today and Tomorrow. (2nd series.) Waldemar Kaempffert.....	962
Science Year Book of 1945. Edited by John D. Ratcliff.....	962
Seiffert, Gustav. Virus Diseases in Man, Animal and Plant.....	280
Sex in Marriage. (3rd ed.) Ernest R. Groves and Gladys Hongland Groves.....	413
Shorter History of Science, A. Sir William Cecil Dampier.....	163
Simmons, Wayne, Anderson and Horack. Global Epidemiology: A Geography of Disease and Sanitation.....	529
Simplified Diabetic Management. J. T. Beardwood, Jr., and H. T. Kelly.....	69
Smith, May. The Handbook of Industrial Psychology.....	651
Social Work Year Book 1945. (8th ed.) Edited by Russell H. Kurtz.....	1094
Soldier to Civilian—Problems of Readjustment. George K. Pratt.....	651
Solving Camp Behavior Problems. J. Kenneth Doherty.....	1329
Spanish Summary of the 8th edition (1941) of Standard Methods for the Examination of Dairy Products. A.P.H.A.....	650
Special Delivery. B. D. Rosenberg.....	165
Spiegel, John P., and Grinker, Roy R. Men Under Stress.....	1229
Stern, Bernhard J. American Medical Practice in the Perspectives of a Century....	654
Stern, Edith M., in collaboration with Corcoran, Mary E. The Attendant's Guide....	960
Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases. (7th ed.) 2 vols. Richard P. Strong.....	407
Stream Sanitation. Earle B. Phelps.....	409
Strecker, Edward A., and Appel, Kenneth E. Psychiatry in Modern Warfare.....	1328
Strong, Richard P. Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases. (7th ed.) 2 vols.....	407
Studies on Alcohol: Lay Supplements Nos. 10, 11, and 12. The Drinker and the Drunkard, How Alcohol Affects Psychological Behavior, The Rehabilitation of Inebriates. Quarterly Journal of Studies on Alcohol.....	654
Subcommittee on Manual of Practice and Appraisal of Local Health Work for the Committee on Administrative Practice of the A.P.H.A. Health Practice Indices..	277
Symposium on Wartime Advances in Medicine. American Philosophical Society.....	277
Tandler, Julius. A Biography. Alfred Goetzl and Ralph Arthur Reynolds.....	73
Tanner, Fred Wilbur. The Microbiology of Foods (2nd ed.).....	71
Techniques of Supervision in Public Health Nursing. Ruth B. Freeman.....	67
Textbook of Healthful Living (3rd ed.). Harold S. Diehl.....	1089
Thom, Charles, and Raper, Kenneth B. A Manual of the Aspergilli.....	1228
To Live in Health. R. Will Burnett.....	281
Trichinosis. Sylvester E. Gould.....	409
Tropical Medicine. (5th ed.) Sir Leonard Rogers and Sir John W. D. Megaw.....	959
Tropical Nursing. A Handbook for Nurses and Others Going Abroad. (2nd ed.) A. L. Gregg.....	170
Trumper, Max, and Cabtarow, Abraham. Lead Poisoning.....	524
Tuberculosis in the United States, Graphic Presentation, Vol. 2. Medical Research Committee, National Tuberculosis Association.....	867
Twentieth Century Fund. Postwar Planning in the United States: An Organization Directory .....	411



## Books and Reports—Continued

	Page
University of Chicago Dept. of Education. Forty-third Year Book of the National Society for the Study of Education. Part I. Adolescence.....	169
Urban, John. Behavior Changes Resulting from a Study of Communicable Diseases..	72
Vincent, E. Lee, and Breckenridge, Marian E. Child Development. Physical and Psychological Growth Through the School Years.....	278
Virus Diseases in Man, Animal and Plant. Gustav Seiffert.....	280
Vital Statistics and Public Health Work in the Tropics. P. Granville Edge.....	168
Vital Statistics Directory (3rd ed.). Compiled by the Vital Statistics Section of the A.P.H.A. . . . .	960
Voluntary Health Agencies. An Interpretive Study. Selskar M. Gunn and Philip S. Platt . . . . .	1234
See: Editorial . . . . .	1070
Waksman, Selman A. Microbial Antagonisms and Antibiotic Substances.....	868
Waterman, Theda L. Nursing for Community Health.....	168
Welfare Council, Committee on Information Services of the. Directory of Social Agencies in the City of New York, 1944-45.....	762
Wilder, Russell M., and Williams, Robert R. Enrichment of Flour and Bread.....	525
Williams, Robert R., and Wilder, Russell M. Enrichment of Flour and Bread.....	525
Woman's Medical Problems. Maxine Davis.....	1330
Wooten, Kathleen Wilkinson. Health Text-Workbook, An Orientation Course in Personal, Racial, Home and Community Hygiene. (4th ed. rev.).....	1326
Worth, C. Brooke, Mackie, Thomas T., and Hunter, George W. Manual of Tropical Medicine . . . . .	959
Wounded Get Back, The. Albert Q. Malsel.....	416
Yater, Wallace Mason. Fundamentals of Internal Medicine. (2nd ed.).....	525
Year Book of General Therapeutics, 1943. Edited by Oscar W. Bethea.....	66
Yost, Edna; in collaboration with Gilbreth, Lillian M. Normal Lives for the Disabled..	416
Books Received.....	63, 174, 286, 416, 531, 656, 764, 871, 965, 1095, 1237, 1333
Boudreau, Frank G., M.D. Future Implications of the Nutritive Value of the American Wartime Diet . . . . .	243
Branham, Sara E., Ph.D., M.D. Value of Typing Meningococci.....	233
Break-Point Chlorination, Bacteriological Improvements Obtained by the Practice of. A. E. Griffin, Ph.B., and N. S. Chamberlin.....	199
"Break-Point" Chlorination, Superchlorination and. Editorial.....	733
Breed, Robert S., Ph.D., Chairman. Report of the Standard Methods Committee on Examination of Milk and Milk Products.....	847
Breed, Robert S., Ph.D., and Brew, James D., Ph.D. The Bacteria "Count"—An Estimate Capable of Accurate Interpretation. (Followed by Discussion by Robert S. Breed, Ph.D.) . . . . .	683
Brew, James D., Ph.D., and Breed, Robert S., Ph.D. The Bacteria "Count"—An Estimate Capable of Accurate Interpretation. (Followed by Discussion by Robert S. Breed, Ph.D.) . . . . .	683
Brewer, Charles M., Referee. Chemical Disinfectants. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839
Brooklyn, N. Y. See:	
Medical Cooperation with the Fort Greene Industrial Health Committee. Charles F. McCarty, M.D.....	947
Plan of the Fort Greene Industrial Health Committee. Jacob H. Landes, M.D.....	602
Brown, E. W., Capt. (MC) USN, Wheeler, S. M., Lt. (MC) USNR, Ingraham, H. S., Lt. (MC) USNR, Hollaender, Alexander, Ph.D., Lill, N. D., Lt. Comdr. (MC) USNR, and Gershon-Cohen, J., Lt. Comdr. (MC) USNR. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report.....	457
Brown, H. W., M.D. Current Problems in Filariasis.....	607
Bureau of the Census. See: Infant Mortality in Relation to Month of Birth. Paris R. Eastman . . . . .	913
Burke, Bertha S. Nutrition and Its Relationship to the Complications of Pregnancy and the Survival of the Infant. (Followed by discussion by Harold C. Stuart, M.D.).....	334

## C

Calcification in Negative Reactors to Tuberculin, Pulmonary. Amos Christie, M.D., and J. C. Peterson, M.D.....	1131
California's Anniversary. Editorial.....	1320
Camp Forrest, Tenn. See: Making Food Handlers Health Conscious. H. A. Morgan, Jr., M.D., M.P.H., Thomas B. Muse, and Albertine McKellar.....	28
Cancer Problem in Massachusetts, The Statistical Approach to the. Evelyn A. Potter and Mildred R. Tully.....	485
Career Service in Public Health. Landmarks of 1944. William P. Shepard, M.D.....	11
Carriers, Laboratory Criteria of the Cure of Typhoid. Roy F. Feemster, M.D., Dr.P.H., and Helen M. Smith.....	368
Cartography. See: Equal-area Projections and the Azimuthal Equidistant Projection in Maps and Disease. Saul Jarcho, Major MC.....	1005

	Page
Castillo, German, M.D., M.P.H. Problems of Health Education in Latin-America.....	1297
Census Bureau, Hats Off to the. Editorial.....	381
Cereal Products, Meat and Meat Products and. Report of the Committee on Microbiological Examination of Foods. Harry E. Goresline, Ph.D., Chairman.....	829
Challenge of Malaria Control, The. Editorial.....	271
Challenge to the Voluntary Health Agency, A. Editorial.....	1070
Challenges of Public Health, Changing. C.-E. A. Winslow, Dr.P.H.....	191
Chamberlin, N. S., and Griffin, A. E., Ph.B. Bacteriological Improvements Obtained by the Practice of Break-Point Chlorination.....	199
Chaney, Margaret S., Ph.D. Integrating Nutrition Education and Activities in the School Program .....	728
Chang, Shih Lu, Taylor, Margery P., Wineman, Margaret A., and Fair, Gordon M. Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents..	228
Changing Challenges of Public Health. C.-E. A. Winslow, Dr.P.H.....	191
Cheddar Cheese. See: Application of the Phosphatase Test to Cheese. 1. A Preliminary Report on Cheddar Type Cheese. Harry Scharer.....	358
Cheese, Application of the Phosphatase Test to. 1. A Preliminary Report on Cheddar Type Cheese. Harry Scharer .....	358
Chemical Antiseptics. Henry Welch, Ph.D., Referee. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839
Child Health Problems, Effect of the Increased Birth Rate on Maternal and. John M. Saunders, M.D. ....	140
Child Health Services, Indices and Standards for. Myron E. Wegman, M.D., and Marjorie T. Bellows .....	715
Childhood and Military Fitness, Physical Growth in. Antonio Ciocco, Sc.D.....	927
Children, Influence of Psychological Factors on the Nutrition of. Milton J. E. Senn, M.D.	211
Children in France, Review of the Evidence as to the Nutritional State of. Harold C. Stuart, M.D. ....	299
Chemical Disinfectants. Charles M. Brewer, Referee. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839
Chlorination, Bacteriological Improvements Obtained by the Practice of Break-Point. A. E. Griffin, Ph.B., and N. S. Chamberlin.....	199
Chlorination, Superchlorination and "Break-Point." Editorial.....	733
Christie, Amos, M.D., and Peterson, J. C., M.D. Pulmonary Calcification in Negative Reactors to Tuberculin.....	1131
Ciocco, Antonio, Sc.D. Physical Growth in Childhood and Military Fitness.....	927
Civil Affairs Division. See: Health Programs Under Military Government. Brig. Gen. James S. Simmons, M.C., Col. Thomas B. Turner, M.C., and Col. Ira V. Hiscock, Sn.C.	35
Civil Service. See: On Making Public Health Positions More Attractive. Joseph W. Mountin, M.D. ....	1148
Clark, Dean A., Senior Surgeon (R), USPHS. Industrial Hygiene and the Expanded Federal-State Vocational Rehabilitation Program.....	504
Clifford, Martha L., M.D., and Olson, Ruth M., R.N. Nursing Techniques in Maternity Hospitals. Streamlining Hospital Techniques.....	1199
Clinical Manifestations of Dietary Inadequacy, Field Study of the Prevalence of the. William J. Darby, M.D., Ph.D., and D. F. Milam, M.D.....	1014
Clinical Tests for Nutritional Deficiencies, Statistical Research in. Dorothy G. Wiehl....	1168
Cole, F. H., M.D., and Graves, L. M., M.D. Memphis and Shelby County Tuberculosis Control Program .....	934
Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Role of $\beta$ -Hemolytic Streptococci in Common Respiratory Disease. Presented by Capt. Elias Strauss, M.C.	675
Committee List, 1944-1945, American Public Health Association.....	388, 540
Committee on Administrative Practice, A Twenty-five Year Review of the Work of the. Wilton L. Halverson, M.D.....	1233
Committees, Reports of:	
Accident Prevention—An Essential Public Health Service. Program Developed by Subcommittee on Accident Prevention, Committee on Administrative Practice. Donald B. Armstrong, M.D., Chairman.....	216
Administrative Practice:	
Program Developed by Subcommittee on Accident Prevention. Accident Prevention—An Essential Public Health Service. Donald B. Armstrong, M.D., Chairman .....	216
Prepared by Subcommittee on Accident Prevention. Suggested Home Safety Activities .....	219
Archivist—1944. Anna M. Sexton.....	849
Examination of Germicides and Antibacterial Agents. Stuart Mudd, M.D., Chairman. Chemical Antiseptics—Henry Welch, Ph.D. Chemical Disinfectants—Charles M. Brewer. Antibiotic Agents—Selman A. Waksman. Disinfection of Air by Germicidal Vapors and Mists—O. H. Robertson, M.D. Disinfection of Air by Ultraviolet Irradiation—Alexander Hollaender, Ph.D. Fungicidal and Fungistatic Agents (Proposed Method for Testing Fungicides against Trichophyton)—C. W. Emmons, Ph.D. ....	839
Examination of Milk and Milk Products (Standard Methods). Robert S. Breed, Ph.D., Chairman .....	847
Examination of Water and Sewage (Standard Methods). W. L. Mallmann, Ph.D., Chairman .....	957

Committees, Reports of—Continued	Page
Frozen Desserts and Ingredients (Joint Standard Methods). Laboratory Chairman, Friend Lee Mickle, Sc.D. Food and Nutrition Chairman, F. W. Fabian.....	837
Industrial Anthrax. Anthrax in the United States, 1939-1943. Henry Field Smyth, M.D., Dr.P.H., Chairman.....	850
Microbiological Examination of Foods. Meat and Meat Products and Cereal Products. Harry E. Goresline, Ph.D., Chairman.....	829
Post-War Sanitary Engineering Problems. A. H. Fletcher, Chairman.....	751
Problems in Cost Accounting for Health Education. H. E. Kleinschmidt, M.D., Chairman.....	1075
Professional Education:	
Proposed Report on the Educational Qualifications of Health Officers. W. P. Shepard, M.D., Chairman.....	42
Proposed Report on the Educational Qualifications of Public Health Dentists. W. P. Shepard, M.D., Chairman.....	45
Declaration by the Committee. Veterans' Preference in Public Health Agencies of the United States.....	253
Proposed Report on the Educational Qualifications of Executives of Voluntary Health Associations. W. P. Shepard, M.D., Chairman.....	499
Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year 1944-1945. W. P. Shepard, M.D., Chairman.....	1311
Shellfish. L. M. Fisher, C.E., Chairman.....	739
Suggested Home Safety Activities. Prepared by Subcommittee on Accident Prevention of the Committee on Administrative Practice.....	219
Utilization of Commercial Advertising for Health Education. David Resnick, Chairman	859
Water Supply. Charles R. Cox, Chairman.....	743
Communicable Diseases. See:	
Control Measures Against Importation of Disease by Men Returning from Overseas Duty. Lt. Col. Thomas G. Ward, MC, AUS.....	572
Health Programs Under Military Government. Brig. Gen. James S. Simmons, MC, Col. Thomas B. Turner, MC, and Col. Ira V. Hiscock, Sn.C.....	85
North Carolina's Reportable Diseases. C. P. Stevick, M.D.....	1029
Communicable Diseases, Control of. Editorial.....	162
Complement-Fixation Test in the Study of Rickettsial Diseases, Applications of the. Ida A. Bengtson, Ph.D.....	701
Complications of Pregnancy and the Survival of the Infant, Nutrition and Its Relationship to the. Bertha S. Burke. (Followed by Discussion by Harold C. Stuart, M.D.)..	334
Comprehensive Training Program for Public Health Personnel, A. George St. J. Perrott..	1155
Conferences and Dates.....	88, 190
Connecticut. See: Nursing Techniques in Maternity Hospitals. Streamlining Hospital Techniques. Ruth M. Olson, R.N., and Martha L. Clifford, M.D.....	1199
Connor, Mary C., R.N. Preparation of the Public Health Nurse to Meet Psychosomatic Problems in Today's Health Program.....	133
Constructive Thinking About Medical Care. Editorial.....	159
Control Air-borne Infections, Evaluation of Methods to. James E. Perkins, M.D.....	891
Control Measures Against Importation of Disease by Men Returning from Overseas Duty. Lt. Col. Thomas G. Ward, MC, AUS.....	572
Control of Communicable Diseases. Editorial.....	162
Control of the 1913-1914 Epidemic of Dengue Fever in Honolulu, Sanitary Aspects of the. Wesley E. Gilbertson, P.A. Engineer (R).....	261
Control of Typhus Fever in Mexican Villages and Rural Populations Through the Use of DDT. Carlos Ortiz-Mariotte, M.D., M.P.H., Felipe Malo-Juvera, M.D., M.P.H., and George C. Payne, M.D., Dr.P.H.....	1191
Cookery, Nutritional Problems That Arise in Large Scale. C. M. McCay, Lt. Com., H(S), USNR ..	143
Coöperative Public Health, I. A Pattern for. Today's Global Frontiers in Public Health. George C. Dunham, M.D., Dr.P.H.....	89
Correctness of Thinking in Matters of Health, Teaching. Carl J. Potthoff, M.D., M.P.H....	1036
Cost Accounting for Health Education, Report of the Committee on Problems in. H. E. Kleinschmidt, M.D., Chairman.....	1075
Cox, Charles R., Chairman. Report of the Committee on Water Supply.....	743
Crabtree, James A., M.D. Today's Global Frontiers in Public Health. IV. The Immediate World Task in Public Health.....	106
Credit Lines.....	55, 515, 615, 860, 1079
Accident Fatalities Increase Among Preschool Children, Home.....	865
Alabama State Dept. of Health. See: Public Health . . . Is Many Things.....	647
American Social Hygiene Association. See:	
Another Good Annual Report.....	1084
The Social Hygiene Campaign in the Other American Republics.....	517
And We Like This Annual Report, Too.....	56
Annual Reports, More About.....	864
Associated Hospital Service. See: Worth Acquiring.....	1084
Baltimore City Health Dept. See: One City's Record.....	58
Bankers Discover Medical Care.....	1081
Barron, J. Lloyd, C.E. See: Public Health Engineering in the Food Industry.....	523

	Page
<b>Credit Lines—Continued</b>	
Birth Rate. See: The Wave of the Future.....	518
Birth Registration. See: Parents, Can You Prove We Are Your Own?.....	1084
Bolt, Richard A., M.D., Dr.P.H. See: "The Capacity for Courageous Wrath".....	522
Bombay. See: Planning.....	1079
Borden Company Nutrition Research. See: Worth Acquiring.....	521
British Columbia Revises Its School Routines.....	862
Bronx Tuberculosis and Health Committee. See: Worth Acquiring.....	521
California, Some Recent Developments in VD Education by Radio in.....	519
California Warns Against Rheumatic Fever in Spanish.....	649
Canada, Some Recent Development in VD Education by Advertising and Radio in.....	519
Cancer. See:	
Light for the Great Darkness (by Raymond S. Patterson, Ph.D.).....	1083
Worth Acquiring.....	647
Cancer Teaching Project in Nassau County, N. Y.....	648
Capacity for Courageous Wrath," "The.....	522
Chicago Council of Social Agencies. See: More About Annual Reports.....	864
Child Life Saving, Twenty Years of.....	520
Church and Returning Service Personnel. See: Worth Acquiring.....	522
Cincinnati, Problem Boys in. See: Worth Acquiring.....	1084
Cincinnati Records Declining Death Rate at Older Ages.....	647
CIO Counselling. See: Health and Welfare Services on the Labor Front—Random Samples.....	1079
Cleveland Child Health Association. See: "The Capacity for Courageous Wrath"....	522
Cleveland County, Okla. See: Telling the Community about the Health Department..	1083
Cleveland County Oklahoma Health Dept.....	56
Columbia County (N. Y.) Health Department, Twelve Years of the.....	1082
Commerce Speaks Up for the Local Health Officers.....	865
Consumer's League. See: Oh Yes! There Are Joys in New York.....	649
Conversation Piece. Contributed by Raymond S. Patterson, Ph.D.....	648
Crusader, publication of the Wisconsin Anti-Tuberculosis Association. See: Worth Acquiring.....	647
Declining Death Rate at Older Ages, Cincinnati Records.....	647
"D-Day Against TB".....	1082
Dental Care Program, A. As a Dentist and a Dental Tradesman See It.....	860
Dental Health Education in New Jersey.....	1084
Dental Health Section. See: Public Health Dentistry.....	517
Des Moines (Iowa) Public Schools. See: One Solution of a Perplexing School Problem..	56
Digest of the Health and Physical Education Recommendations in the 1944 Yearbook of the Educational Policies Commission Education for ALL American Youth.....	645
District of Columbia Social Hygiene Society monthly bulletin. See: Worth Acquiring	522
Doctors Talk It Over," "The. See: Worth Listening to.....	1084
Education. See: What Makes a Nation Great?.....	1083
Educational Policies Commission. See: A Digest of the Health and Physical Education Recommendations in the 1944 Yearbook of the Educational Policies Commission Education for ALL American Youth.....	645
Eyesight in Industry, Protecting. See: Worth Acquiring.....	1084
Federal Council of Churches of Christ in America. See: Worth Acquiring.....	522
Food Industry, Public Health Engineering in the.....	523
Ford, Edsel, Estate Bought for Union Health Center. See: Statesmen Discover Medical Care.....	516
Foster Children, Help With.....	62
Frantz, Ruth J. See: There's Gold in Them Thar Hills.....	1082
Free World Association of Hollywood. See: Worth Acquiring.....	522
Geriatrics, Nutrition in. See: Worth Acquiring.....	521
Getting, Dr. Vlado A. See: A New First—Massachusetts Health Week.....	862
Go, and Do Thou Likewise.....	518
Health and Welfare Services on the Labor Front—Random Samples.....	1079
Health Council Digest. See: Health and Welfare Services on the Labor Front—Random Samples.....	1079
Health Department Studies Home Safety, A.....	60
Health Education. See: There's Gold in Them Thar Hills.....	1082
Health Education Motion Pictures. See: Worth Acquiring.....	521
Health Education Section Regional Program. Some Activities of the Sections.....	516
History of Tuberculosis Prevention, The.....	1082
Home Accident Fatalities Increase Among Preschool Children.....	865
Housing Authority, New Haven.....	864
Housing, National Committee on. See: Worth Acquiring.....	521
Houston, Texas, Typhus leaflet. See: Worth Acquiring.....	1084
Indiana Looks Ahead.....	515
It's Going Places—That School Health Section.....	60
Junior Chamber of Commerce, Public Health Manual of the U. S.....	862
Juvenile Guidance. See: Worth Acquiring.....	1084
Kentucky Medical Journal. See: Memorial Issue for Arthur T. McCormack, M.D.....	59
Labor Front, Health and Welfare Services on the.—Random Samples.....	1079
Light for the Great Darkness (by Raymond S. Patterson, Ph.D.).....	1083
Local Health Officers, Commerce Speaks Up for the.....	865

## Credit Lines—Continued

	Page
Local Health Units, Committee on. See: Indiana Looks Ahead.....	515
Lorain County, Ohio, Celebrates 25 Years of the Health Department.....	863
Los Angeles County Tuberculosis and Health Association. See: Worth Acquiring...	1084
Manual of the U. S. Junior Chamber of Commerce, Public Health.....	862
Maryland. See: Planning.....	1079
Massachusetts Health Week—A New First.....	862
Massachusetts State Dept. of Health. See: Millville Helps Itself.....	619
Maternity Center Association of New York. See: The Wave of the Future.....	518
"May His Tribe Increase".....	62
McCormack, M.D.—Memorial Issue for Arthur T.....	59
Medical Care, Bankers Discover.....	1081
Medical Care, Statesmen Discover.....	516
Medical Care for Everybody? See: Worth Acquiring.....	1086
Memorial Issue for Arthur T. McCormack, M.D.....	59
Mental Hygiene, Rehabilitation Division of the National Committee for. See: Worth Acquiring . . .	522
Metropolitan Life Insurance Co. See: Twenty Years of Child Life Saving.....	520
Milk, Food and Restaurant Sanitation.....	865
Millville Helps Itself.....	619
Minnesota Health Authorities Promote Home Safety.....	59
Minnesota, Nutrition Bibliographies. See: Worth Acquiring.....	1084
Mississippi State Board of Health. See: Worth Acquiring.....	1084
Montreal. See: Planning.....	1079
More About Annual Reports.....	864
Mortality Rates at the School Ages. See: Twenty Years of Child Life Saving.....	520
Movie? What of the Future of the Health.....	55
Nassau County, N. Y., Cancer Teaching Project in.....	618
Nassau County Tuberculosis and Public Health Association. See: Worth Acquiring..	521
National Biscuit Co. See: Public Health Engineering in the Food Industry.....	523
National Live Stock and Meat Board. See: Worth Acquiring.....	522
Negro Physicians in the United States.....	865
Newark, N. J. See: Public Housing Pays Dividends.....	1083
New First, A—Massachusetts Health Week.....	862
New Haven Housing Authority.....	864
New Jersey, Dental Health Education in.....	1084
New Jersey Looks at Local Government.....	68
New York City, Some Recent Developments in VD Education by Posters on Bus and Street Car in.....	520
New York! Oh Yes! There Are Joins in.....	619
Northern California Union Health Committee. See: Health and Welfare Services on the Labor Front—Random Samples.....	1079
Ohio State Mental Hospital. See: Soap Sculpture in the Psychiatric Ward.....	618
One City's Record.....	58
One Solution of a Perplexing School Problem.....	56
Parents, Can You Prove We Are Your Own?.....	1084
Pasadena Health Dept., 1943 Annual Report.....	56
Planning . . .	1079
Posters for Restaurant Sanitation. U.S.P.H.S.....	523
Post-war World, This Is Now a.....	1079
Praise from an Expert.....	56
Psychiatric Ward, Soap Sculpture in the.....	618
Public Affairs Packet on Jobs and Security. See: Worth Acquiring.....	1084
Public Affairs Pamphlets, About Veterans and Current Matters.....	1081
Public Health Dentistry.....	517
Public Health Engineering in the Food Industry.....	523
Public Health . . . Is Many Things.....	617
Public Health Manual of the U. S. Junior Chamber of Commerce.....	862
Public Health Nursing as a Career.....	59
Public Housing Pays Dividends.....	1083
Public Medical Care in a Public Affairs Pamphlet.....	861
Queensboro Tuberculosis and Health Association. See: Conversation Piece.....	618
Rehabilitation Division of the National Committee for Mental Hygiene. See: Worth Acquiring . . .	522
Report on School Health Priorities.....	61
Restaurant Sanitation, Posters for. U.S.P.H.S.....	523
Rheumatic Fever in Spanish, California Warns Against.....	619
Rochester, Minn., Child Health Project. See: Worth Acquiring.....	1084
Roumania—Social Welfare News Out of Central Europe.....	1080
Sanitation, Milk, Food and Restaurant.....	865
School Health. See: British Columbia Revises Its School Routines.....	862
School Health Priorities, Report on.....	61
School Health Section. See: "May His Tribe Increase".....	62
Skillful Interpretation . . .	59
Soap Sculpture in the Psychiatric Ward.....	618

	Page
<b>Credit Lines—Continued</b>	
Social Hygiene Campaign in the Other American Republics, The.....	517
Social Welfare News Out of Central Europe—Roumania.....	1080
Spastic Review, The. See: Skillful Interpretation.....	59
Statesmen Discover Medical Care.....	516
Statistical Bulletin of the Metropolitan Life Insurance Co. See: Twenty Years of Child Life Saving.....	520
Syphilis in Cleveland.....	60
Telling the Community About the Health Department.....	1083
There's Gold in Them Thar Hills.....	1082
There Were Giants in Those Days.....	58
This Is Now a Post-war World.....	1079
Trends in Longevity. See: Worth Acquiring.....	1084
Tuberculosis. See: "D-Day Against TB".....	1082
Tuberculosis Hospitals, Patients' Education in. See: Worth Acquiring.....	521
Tuberculosis Prevention, The History of.....	1082
Twelve Years of the Columbia County (N. Y.) Health Department.....	1082
Underwood, Felix J., M.D. See: Twenty Years of Underwood in Mississippi.....	517
UNRRA: Organization, Aims and Progress. See: Worth Acquiring.....	1084
VD Education, Some Recent Developments in:	
By Radio in California.....	519
By Advertising and Radio in Canada.....	519
By Posters on Bus and Street Car in New York City.....	520
Veneral Disease. See: Worth Acquiring.....	1084
Veterans and Current Matters, Public Affairs Pamphlets, About.....	1081
Vital Statistics Directory, A.P.H.A.....	515
Wagner Bill. See: A Dental Care Program.....	860
Wave of the Future, The.....	518
West, Miss Jessamyn. See: Go, and Do Thou Likewise.....	518
What Makes a Nation Great?.....	1083
What of the Future of the Health Movie?.....	55
Winslow, Professor. See: Public Medical Care in Public Affairs Pamphlet.....	801
Worth Acquiring.....	521, 647, 1084
Worth Listening To.....	1084
<b>Cross-connections and Back-siphonage Connections Under War Conditions. Sanitary Engineering Report 8, National Research Council.....</b>	637
<b>Crumbine, Samuel J., M.D. Puerto Rico Provincial Board of Health Created 1763. Letter to the Editor.....</b>	384
<b>Current Problems in Filariasis. H. W. Brown, M.D.....</b>	607
<b>Current Tuberculosis Statistics in the United States. Mary Dempsey. (Followed by Dis- cussion by J. T. Marshall).....</b>	248
<b>Cysts of Entamoeba Histolytica by Synthetic Detergents, Destruction of Water-borne. Gordon M. Fair, Shih Lu Chang, Marjory P. Taylor, and Margaret A. Wineman.....</b>	228

## D

<b>Dairy Products. Report of the Committee for Standard Methods for the Examination of Milk and Milk Products. Robert S. Breed, Ph.D., Chairman.....</b>	847
<b>Dammin, Gustave J., Major, MC, Nelson, John B., Ph.D., and Tenbroeck, Carl, M.D. Distribution of Shigella in India as Determined by Spot Agglutination with Absorbed Sera.....</b>	1282
<b>Darby, William J., M.D., Ph.D., and Milam, D. F., M.D. Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy.....</b>	1014
<b>Davis, Burnet M., M.D., and Altenderfer, Marion E. Effect of the War on the Distribution of Full-time Local Health Officers.....</b>	1047
<b>DDT, Control of Typhus Fever in Mexican Villages and Rural Populations Through the Use of. Carlos Ortiz-Mariotte, M.D., M.P.H., Felipe Malo-Juvera, M.D., M.P.H., and George C. Payne, M.D., Dr.P.H.....</b>	1101
<b>DDT, Insect Problems in World War II with Special References to the Insecticide. F. C. Bishopp.....</b>	373
<b>Dean, H. Trendley, D.D.S., and Singleton, Dennis E., Jr., D.D.S. Preliminary Con- siderations on the Epidemiology of Ulcerative Gingivostomatitis. Vincent's Infec- tion—A Wartime Disease.....</b>	433

## Page

## Death Notices—Continued

<b>Death Notices..78, 180, 189, 202, 208, 423, 432, 552, 662, 674, 769, 782, 877, 890, 986, 1099, 1120, 1240, 1252</b>	
Anderson, Wade H., M.D.....	1099
Appleberry, Reuben, M.D.....	189
Baker, S. Josephine, M.D., Dr.P.H.....	662
Barrow, Craig, M.D.....	1240
Basler, William James, M.D.....	189
Bean, William Smith.....	190
Bedinger, George R., M.A.....	769
Berman, H. S., M.D.....	662
Blake, Charles Robert, M.D.....	552
Bolling, George E.....	877
Bradshaw, George M. B., M.D.....	662
Brownstein, Simon William, M.D.....	986
Connelly, John Aloysius, M.D.....78,	190
Creel, Ben W., D.V.M.....	877
Davis, Colonel Charles F., MC, USA...	1120
de Stanley, Percy, M.D.....	423
Ellis, William J., Ph.D.....	662
Ernst, Edward Cranch.....	190
Gore, Elva E.....	180
Haines, Blanche M., M.D.....298,	662
Hair, Jess W.....	552

Death Notices—Continued	Page	Death Notices—Continued	Page
Hersey, Jane I., Ph.D.....	180, 100	Patterson, Inez.....	423
Hirsch, Henry Philip, M.D.....	674	Patton, J. Allen, M.D.....	423
Holland, Dorothy F., Ph.D.....	1099	Pauli, William O., M.D.....	423
Holsendorf, Benjamin E., Ph.D.....	877	Perdue, Robert L., M.D.....	1240
Holtegel, Clarence Floyd, M.D.....	674	Pinto, Alva S., M.D.....	180
Hopper, Arthur W., M.D.....	423	Poor, Daniel Warren, M.D.....	782
Howard, Charles D.....	180	Quin, Barbara S.....	877
Howell, William H., M.D.....	423	Rosenberger, Randle C., M.D.....	877
Humphrey, Joseph H., M.D.....	769	Ross, H. R., M.D.....	423
Jackson, J. Frederick.....	1099	Roth, Albert Walton, M.D.....	890
Janko, Nehemiah, M.D.....	662	Sale, Onal A., M.D.....	423
Jones, Hiram A., Ph.D.....	1099	Santiago, Jose M., M.D.....	1240
Kelley, Forrest A., M.D.....	1099	Sawtelle, Henry Fenno, M.D.....	432
Kenwood, Dr. Henry R.....	1120	Schlageter, Emil Arnold, M.D.....	552
Knaus, Lt. Peter J., Sn.C.....	877	Sein, Francisco, M.D.....	1240
Kopp, Marie E., Ph.D.....	180	Skilling, William K., M.D.....	552
Krout, Boyd Merrill, M.D.....	674	Slee, Richard, M.D.....	674
Kuehler, Pauline E.....	423	Smith, Charles Johnson, M.D.....	986
Litterer, William, M.D.....	986, 1099	Stewart, A. H., M.D.....	1099
McCuan, John M., M.D.....	190	Teschner, Paul August, M.D.....	782
McGahey, Frank L., M.D.....	423	Tillinghast, Caroline, R.N.....	1099
McGhie, Bernard T., M.D.....	190, 298, 423	Townsend, Myron T., Ph.D.....	292
McGrath, J. J.....	180	Turner, Smith L., M.D.....	1120, 1240
McKay, Thomas W. G., M.D.....	1099	Vaughn, James B., M.D.....	769
Miner, Frederick B., M.D.....	877	Walsh, Groesbeck, M.D.....	423
Moffat, Gordon B., M.D., D.P.H.....	292, 674	Warren, Mortimer, M.D.....	423
Monjaras, Jesus E., M.D.....	423	Wayson, James Thomas, M.D.....	782
Munson, William R., M.D.....	423	Wheeler, Stafford M., M.D.....	769
Nichols, N. Estes, M.D., Dr.P.H.....	662	Wiggers, Fred A.....	662
Olason, Fridgeir, M.D., M.P.H.....	78, 190	Wild, William Francis, M.D.....	432
Oleson, Robert, M.D.....	1252		
Death Rate. See: The 1944 Record. Editorial.....	1323		
Deceased Members. See: Death Notices			
Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1944-1945, Public Health. Report of the Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	1311		
Dehydrated foods. See: A Method for Control of Sanitation in Food Processing Plants. Reese H. Vaughn and Thressa C. Stadtman.....	1292		
Dempsey, Mary. Current Tuberculosis Statistics in the United States. (Followed by Discussion by J. T. Marshall).....	248		
Dengue Fever in Honolulu, Sanitary Aspects of the Control of the 1943-1944 Epidemic of. Wesley E. Gilbertson, P.A. Engineer (R).....	261		
Dental Economics, Problems of. Editorial.....	52		
Dental Epidemiology. See: Vincent's Infection.			
Denver School Children, Prevalence of Rheumatic Heart Disease in. Bernice G. Wedum, M.D., Arnold G. Wedum, Ph.D., M.D., and A. L. Beagler, M.D.....	1271		
DePorte, J. V., Ph.D. Births and the Newspapers.....	341		
Dermatophytosis a Significant Occupational Health Problem? Is. Samuel M. Peck, Medical Director (R), USPHS, and Louis Schwartz, Medical Director, USPHS.....	621		
Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents. Gordon M. Fair, Shih Lu Chang, Margery P. Taylor, and Margaret A. Wineman.....	228		
Detergents, Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic. Gordon M. Fair, Shih Lu Chang, Margery P. Taylor, and Margaret A. Wineman.....	228		
Diagnosis of Tuberculosis, Recent Trends in the Early. Edward X. Mikol, M.D., M.P.H., and Robert E. Plunkett, M.D.....	1260		
Diarrheal Diseases of the New-born, Practical Implications of the Epidemiology of the. Streamlining Hospital Techniques. James Watt, Surgeon, USPHS.....	1205		
Dietary Inadequacy, Field Study of the Prevalence of the Clinical Manifestations of. William J. Darby, M.D., Ph.D., and D. F. Milam, M.D.....	1014		
Difficulties in Planning Public Health Programs in Tropical Areas. Guillermo Arbona, M.D., M.P.H., and Pablo Morales-Otero, M.D.....	1057		
"Diphtheria Rebounds." Editorial.....	826		
Disinfection of Air by Germicidal Vapors and Mists. O. H. Robertson, M.D., Associate Referee. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839		
Disinfection of Air by Ultra-violet Irradiation. Alexander Hollander, Ph.D., Associate Referee. See: Report of the Committee on the Examination of Germicides and Antibacterial Agents.....	839		
Disinfection of drinking water. See: Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents. Gordon M. Fair, Shih Lu Chang, Margery P. Taylor, and Margaret A. Wineman.....	228		
Distribution of Full-time Local Health Officers, Effect of the War on the. Burnet M. Davis, M.D., and Marion E. Altenderfer.....	1047		

	Page
Distribution of <i>Shigella</i> in India as Determined by Spot Agglutination with Absorbed Sera. John B. Nelson, Ph.D., Carl Tenbroeck, M.D., and Gustave J. Dammin, Major, MC . . . . .	1282
Does Health Education Prevent Venereal Disease? The Army's Experience with 8,000,000 Men. Capt. Granville W. Larimore and Lt. Col. Thomas H. Sternberg.....	799
Doull, James A., M.D. Tuberculosis Mortality in England and Certain Other Countries During the Present War.....	783
Downes, Jenn. Sickness as an Index of the Need for Health Supervision of the School Child . . . . .	593
Drolet, Godias J. World War I and Tuberculosis. A Statistical Summary and Review....	689
Dublin, Louis I., Ph.D. Association Impacts—Past and Present. Landmarks of 1944.....	22
Dublin, Louis I., Ph.D. War and the Birth Rate—A Brief Historical Summary.....	315
Dunbar, Flanders, M.D. Public Health Aspects of Psychosomatic Problems.....	117
Dunham, George C., M.D., Dr.P.H. I. A Pattern for Cooperative Public Health. Today's Global Frontiers in Public Health.....	89
Dunn, Halbert L., M.D. Letter to the Editor. Comment on "Infant Mortality in Relation to Month of Birth" by Paris R. Eastman.....	1226
Dust. See: Study and Control of Industrial Atmospheric Pollution Nuisances. Fränk M. Stead.....	491
Dyktor, Herbert G. Industrial Hygiene and Labor.....	480
Dysentery. See: Distribution of <i>Shigella</i> in India as Determined by Spot Agglutination with Absorbed Sera. John B. Nelson, Ph.D., Carl Tenbroeck, M.D., and Gustave J. Dammin, Major, MC . . . . .	1282

E

Eastern Equine Type Encephalomyelitis. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D.....	994
Eastman, Paris R. Infant Mortality in Relation to Month of Birth.....	913
See: Letter to the Editor. Halbert L. Dunn, M.D.....	1226
Eberthella typhosa, Salmonella paratyphi, and Salmonella schottmuelleri, Active Immunization with Purified Somatic Antigens of. Lt. Herbert R. Morgan, MC, AUS.....	614
Editorials.....	49, 159, 271, 379, 509, 640, 732, 824, 951, 1070, 1221, 1319
Accreditation of Schools of Public Health.....	953
Administration, Three "R's" of.....	826
Air-borne Infection, The Problem of.....	951
Aluminum vs. Silica.....	736
American Journal of Public Health, The.....	1319
Baltimore the Oldest Health Department? Has.....	49
Basic Essentials of Milk Sanitation.....	50
Blood Plasma. See: Gamma Globulin for Measles.....	732
"Break-Point" Chlorination, Superchlorination and.....	733
California's Anniversary . . . . .	1320
Census Bureau, Hats Off to the.....	381
Challenge of Malaria Control, The.....	271
Challenge to the Voluntary Health Agency, A.....	1070
Chlorination, Superchlorination and "Break-Point".....	733
Communicable Diseases, Control of.....	162
Constructive Thinking About Medical Care.....	159
Control of Communicable Diseases.....	162
Death rate. See: The 1944 Record.....	1323
Dental Economics, Problems of.....	52
"Diphtheria Rebounds" . . . . .	826
Europe. See: "Diphtheria Rebounds".....	826
Expanding Scope of Public Health Laboratories, The.....	275
Franklin Delano Roosevelt.....	509
Gamma Globulin for Measles.....	732
Has Baltimore the Oldest Health Department?.....	49
Hats Off to the Census Bureau.....	381
Health Instruction in New York State, School.....	513
Health Insurance Plan for Greater New York.....	643
Hill-Burton Bill, The.....	380
Housing Inspection—1945 Model.....	511
HR 2550. See: New Leadership in Mental Hygiene.....	640
Hygiene of Housing, Committee on the. See: Housing Inspection—1945 Model.....	511
Industrial Nursing. See: The Nurse in Industry.....	510
Labor Becomes Increasingly Health Conscious, Organized.....	382
Local Health Units. See: A Third of the Nation without Health Protection.....	952
Malaria Control, The Challenge of.....	271
Marriage Bells in Seattle.....	1321
Measles, Gamma Globulin for.....	732
Medical Care, Constructive Thinking About.....	159
Mental Hygiene, New Leadership in.....	640
Milk Sanitation, Basic Essentials of.....	50



## Editorials—Continued

	Page
National Health Council. See: A Challenge to the Voluntary Health Agency.....	1070
New Leadership in Mental Hygiene.....	640
New York, Health Insurance Plan for Greater.....	643
New York State, School Health Instruction In.....	513
1944 Record, The.....	1323
Nurse in Industry, The.....	510
Nutritional Deficiency, The Wide Significance of.....	273
Oldest Health Department? Has Baltimore the.....	49
Organized Labor Becomes Increasingly Health Conscious.....	382
Problem of Air-borne Infection, The.....	951
Problems of Dental Economics.....	52
Public Health Degrees and Certificates. See: Too Many Degrees.....	163
Public Health Laboratories, The Expanding Scope of.....	275
Public Health Service Act. See: The Hill-Burton Bill.....	380
Records.....	955
Roosevelt, Franklin Delano.....	509
Salmonellosis, Shigellosis and.....	641
San Francisco Security Conference. See: Shall We Declare War at San Francisco?..	379
School Health. See: The Test of King Solomon.....	1222
School Health Instruction in New York State.....	513
Schools of Public Health, Accreditation of.....	953
"Scrub Typhus".....	1221
Seattle, Marriage Bells in.....	1321
Seeing Eye in Tuberculosis Control, The.....	1224
Senate Bill 101. See: The Hill-Burton Bill.....	380
Shall We Declare War at San Francisco?.....	379
Shigellosis and Salmonellosis.....	641
Silica, Aluminum vs. ....	736
Silicosis. See: Aluminum vs. Silica.....	736
Social Security Amendments. See: The Wagner Bill of 1945.....	824
Superchlorination and "Break-Point" Chlorination.....	733
Test of King Solomon, The.....	1222
Third of the Nation without Health Protection, A.....	952
Three "R's" of Administration.....	826
Too Many Degrees.....	163
Tuberculosis Control, The Seeing Eye in.....	1224
Typhus. See: "Scrub Typhus".....	1221
Visiting Nurse Service. See: Marriage Bells in Seattle.....	1321
Vital Statistics Division. See: Hats Off to the Census Bureau.....	381
Voluntary Health Agency, A Challenge to the.....	1070
Wagner Bill of 1945, The.....	824
Water disinfection. See: Superchlorination and "Break-Point" Chlorination.....	733
Wide Significance of Nutritional Deficiency, The.....	273
Education. See: Teaching Correctness of Thinking in Matters of Health. Carl J. Potthoff, M.D., M.P.H. ....	1036
Education Methods of the Red Cross, Health. H. E. Kleinschmidt, M.D.....	1181
Education, New Developments in Teacher. With Implications for Health Education. Maurice E. Troyer, Ph.D.....	1022
Educational Qualifications of Executives of Voluntary Health Associations, Proposed Report on the. Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	499
Educational Qualifications of Health Officers. Proposed Report on the. Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	42
Educational Qualifications of Public Health Dentists. Proposed Report on the. Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	45
Effect of Increased Birth Rate on Future Population. P. K. Whelpton.....	326
Effect of the Increased Birth Rate on Maternal and Child Health Problems. John M. Saunders, M.D. ....	140
Effect of the War on the Distribution of Full-time Local Health Officers. Burnet M. Davis, M.D., and Marion E. Altenderfer.....	1047
Elephantiasis. See: Current Problems in Filariasis. H. W. Brown, M.D.....	607
Emergency Health and Sanitation Appropriation. See: Public Health in the Reconversion Period. Thomas Parran, M.D.....	987
Emerson, Haven, M.D., and Luginbuhl, Martha, M.A. 1,200 Local Public Health Departments for the United States.....	808
Emmons, C. W., Ph.D., Associate Referee. Fungicidal and Fungistatic Agents. Proposed Method for Testing Fungicides against Trichophyton. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839
Emotional Problems of Adolescence, Physiological and. Physical Fitness and Health Problems of the Adolescent. Lawrence K. Frank.....	575
Employment Service.....	78, 181, 293, 424, 541, 663, 771, 879, 972, 1101, 1241, 1339
Encephalitis, Recent Advances in the Epidemiology of Arthropod-borne Virus. Including Certain Exotic Types. W. McD. Hammon, Dr.P.H., and W. C. Reeves, Ph.D.....	994
Encephalomyelitis With Hyperimmune Rabbit Serum, Successful Treatment of Experimental and Western Equine. Joseph Zichis, Ph.D., and Howard J. Shaughnessy, Ph.D.....	815

	Page
Engineering Technique Applied to Restaurant Sanitation. W. Scott Johnson.....	257
England and Certain Other Countries During the Present War, Tuberculosis Mortality in. James A. Doull, M.D.....	783
Entamoeba Histolytica by Synthetic Detergents, Destruction of Water-borne Cysts of. Gordon M. Fair, Shih Lu Chang, Margery P. Taylor, and Margaret A. Wineman.....	228
Epidemic of Dengue Fever in Honolulu, Sanitary Aspects of the Control of the 1943-1944. Wesley E. Gilbertson, P.A. Engineer' (R).....	261
Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization. Edward Bigg, M.D., B. H. Jennings, M.E., and F. C. W. Olson.....	788
Epidemiology in Wartime, Venereal Disease. J. R. Heller, Jr., M.D.....	1210
Epidemiology of the Arthropod-borne Virus Encephalitides, Recent Advances in the. Including Certain Exotic Types. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	904
Epidemiology of the Diarrheal Diseases of the New-born, Practical Implications of the. Streamlining Hospital Techniques. James Watt, Surgeon, USPHS.....	1205
Epidemiology of Ulcerative Gingivostomatitis, Preliminary Considerations on the. Vin- cent's Infection—A Wartime Disease. H. Trendley Dean, DDS, and Dennis E. Singleton, Jr., DDS.....	433
Equal-area Projections and the Azimuthal Equal-distant Projection in Maps of Disease. Saul Jarcho, Major, MC.....	1005
Equidistant Projection in Maps of Disease, Equal-area Projections and the Azimuthal. Saul Jarcho, Major, MC.....	1005
Equine Encephalomyelitis with Hyperimmune Rabbit Serum, Successful Treatment of Experimental Western. Joseph Zichis, Ph.D., and Howard J. Shaughnessy, Ph.D.....	815
Europe. See: "Diphtheria Rebounds." Editorial.....	826
Evaluation of Adolescents' Health. Physical Fitness and Health Problems of the Adolescent. J. R. Gallagher, M.D.....	584
Evaluation of Local Health Service, Indicated State Health Department Participation in the Promotion of. A.P.H.A. News.....	537
Evaluation of Methods to Control Air-borne Infections. James E. Perkins, M.D.....	891
Evang, Karl, M.D. Discussion. Today's Global Frontiers in Public Health.....	114
Examination of Germicides and Antibacterial Agents, Report of the Committee on. Stuart Mudd, M.D., Chairman.....	839
Examination of Water and Sewage, Report of the Standard Methods Committee on. W. L. Mallmann, Ph.D., Chairman.....	957
Exotic Types, Including Certain. Recent Advances in the Epidemiology of the Arthropod- borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994
Expanding Scope of Public Health Laboratories, The. Editorial.....	275
Expectant Mothers, Dietary Habits. See: The Wide Significance of Nutritional Deficiency. Editorial . . . . .	273

## F

Fabian, F. W., Nutrition Chairman. Mickle, Friend Lee, Sc.D., Laboratory Chairman. Report of the Joint Standard Methods Committee on Frozen Desserts and Ingredients	837
Factors in Army Water Quality Control. W. A. Hardenbergh, Colonel, Sn.C.....	361
Fair, Gordon M., Chang, Shih Lu, Taylor, Margery P., and Wineman, Margaret A. Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents..	228
Far East, II. Regional Health Organization in the. Today's Global Frontiers in Public Health. Szeming Sze, M.D.....	96
Farm Families, Health Services for Migrant. Frederick D. Mott, Senior Surgeon (R), U.S.P.H.S. . . . .	308
Farm Security Administration. See: Health Services for Migrant Farm Families. Frederick D. Mott, Senior Surgeon (R), U.S.P.H.S.....	308
Federal Employees, An Industrial Health Program for. Verne K. Harvey, M.D.....	239
Federal-State Vocational Rehabilitation Program, Industrial Hygiene and the Expanded. Dean A. Clark, Senior Surgeon (R), U.S.P.H.S.....	504
Feeding Patterns. See: Influence of Psychological Factors on the Nutrition of Children. Milton J. E. Senn, M.D.....	211
Feemster, Roy F., M.D., Dr.P.H., and Smith, Helen M. Laboratory Criteria of the Cure of Typhoid Carriers . . . . .	368
Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy. William J. Darby, M.D., Ph.D., and D. F. Milam, M.D.....	1014
Filariasis, Current Problems in. H. W. Brown, M.D.....	607
Fillmore, Anna M., R.N., M.P.H. Nursing Records in Industry.....	221
Films, A Program on Health. Adolf Nichtenhauser, M.D.....	343
Fisher, L. M., C.E., Chairman. Report of the Committee on Shellfish.....	738
Fleas and Disease. See: Insect Problems in World War II with Special References to Insecticide DDT. F. C. Bishopp.....	373
Fletcher, A. H., Chairman. Report of the Committee on Post-War Sanitary Engineering Problems . . . . .	751
Flies and Disease. See: Insect Problems in World War II with Special References to the Insecticide DDT. F. G. Bishopp.....	373

	Page
Foley, George E., and Rubenstein, A. Daniel, M.D., M.P.H. Scarlet Fever in School-rooms. Outbreaks Due to Serologically Typed Hemolytic Streptococci.....	905
Food and Nutrition. See: Future Implications of the Nutritive Value of the American Wartime Diet. Frank G. Boudreau, M.D.....	243
Food Handlers Health Conscious, Making. H. A. Morgan, Jr., M.D., M.P.H., Thomas B. Muse, and Albertine McKellar.....	28
Food Processing Plants, A Method for Control of Sanitation in. Reese H. Vaughn and Thressa C. Stadtman . . . . .	1292
Foods, Report of the Committee on Microbiological Examination of. Meat and Meat Products and Cereal Products. Harry D. Goresline, Ph.D., Chairman.....	829
Food Sanitation. See: Making Food Handlers Health Conscious. H. A. Morgan, Jr., M.D., M.P.H., Thomas B. Muse, and Albertine McKellar.....	28
Fort Bragg, N. C., Commission on Acute Respiratory Diseases. Role of $\beta$ -Hemolytic Streptococci in Common Respiratory Disease. Presented by Capt. Elias Strauss, M.C.	675
Fort Greene Industrial Health Committee, Medical Cooperation with the. Charles F. McCarty, M.D. . . . .	917
Fort Greene Industrial Health Committee, Plan of the. Jacob H. Landes, M.D.....	602
France, Review of the Evidence as to the Nutritional State of Children in. Harold C. Stuart, M.D. . . . .	209
Frank, Lawrence K. Physiological and Emotional Problems of Adolescence. Physical Fitness and Health Problems of the Adolescent.....	575
Franklin Delano Roosevelt. Editorial.....	509
Frontiers in Public Health. See: Today's Global Frontiers in Public Health.	
Frozen Desserts and Ingredients, Report of the Joint Standard Methods Committee on. Laboratory Chairman, Friend Lee Mickle, Sc.D. Food and Nutrition Chairman, F. W. Fabian . . . . .	837
Fungicidal and Fungistatic Agents. Proposed Method for Testing Fungicides against Trichophyton. C. W. Emmons, Ph.D., Associate Referee. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839
Fungous. See: Dermatophytosis.	
Future Implications of the Nutritive Value of the American Wartime Diet. Frank G. Boudreau, M.D. . . . .	243
Future Population, Effect of Increased Birth Rate on. P. K. Whelpton.....	326

## G

Gallagher, J. R., M.D. Evaluation of Adolescents' Health. Physical Fitness and Health Problems of the Adolescent.....	581
Gamma Globulin for Measles. Editorial.....	732
Germicidal Vapors and Mists, Disinfection of Air by. O. H. Robertson, M.D., Associate Referee. See: Report of the Committee on Examination of Germicides and Antibacterial Agents . . . . .	839
Germicides and Antibacterial Agents, Report of the Committee on Examination of. Stuart Mudd, M.D., Chairman.....	839
Gershon-Cohen, J., Lt. Comdr. (MC) USNR, Brown, E. W., Capt. (MC) USN, Wheeler S. M., Lt. (MC) USNR, Ingraham, H. S., Lt. (MC) USNR, Hollaender, Alexander, Ph.D., and Lill, N. D., Lt. Comdr. (MC) USNR. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report.....	457
Gilbert, Ruth, R.N. Relating the Psychosomatic Viewpoint to Public Health Nursing...	123
Gilbertson, Wesley E., P.A. Engineer (R). Sanitary Aspects of the Control of the 1913-1914 Epidemic of Dengue Fever in Honolulu.....	261
Gingivostomatitis, Preliminary Consideration on the Epidemiology of Ulcerative. Vincent's Infection—A Wartime Disease. H. Trendley Dean, DDS, and Dennis E. Singleton, Jr., DDS . . . . .	433
Global Frontiers in Public Health. See: Today's Global Frontiers in Public Health.	
Glycol Vapors for Air Sterilization, Epidemiologic Observations on the Use of. Edward Bigg, M.D., B. H. Jennings, M.E., and F. C. W. Olson.....	788
Goode, Harry H., B.Ch.E., Kantrow, Abraham H., M.D., and Baumgartner, Leona, M.D., Ph.D. Service Records and Their Administrative Uses. Experience from a School Health Service . . . . .	1063
Goresline, Harry E., Ph.D., Chairman. Report of the Committee on Microbiological Examination of Foods. Meat and Meat Products and Cereal Products.....	829
Graves, L. M., M.D., and Cole, F. H., M.D. Memphis and Shelby County Tuberculosis Control Program . . . . .	934
Greenberg, Morris, M.D., Birnkrant, William B., M.D., and Schlifner, Joseph J. Outbreak of Sodium Nitrite Poisoning.....	1217
Greenberg, Morris, M.D., Most, Capt. Harry, MC, AUS, and Birnkrant, William B., M.D. Amebiasis in a Hospital for the Insane.....	805
Griffin, A. E., Ph.B., and Chamberlin, N. S. Bacteriological Improvements Obtained by the Practice of Break-Point Chlorination.....	199
Growth in Childhood and Military Fitness, Physical. Antonio Ciocco, Sc.D.....	927
Growth patterns. See: Statistical Methods in Anthropometric Studies in the Field of Nutritional Research. Rachel M. Jenss, Sc.D.....	1053

Hagerstown, Md. See: Physical Growth in Childhood and Military Fitness. Antonio Ciocco, Sc.D. . . . .	927
Halverson, Wilton L., M.D. A Twenty-five Year Review of the Work of the Committee on Administrative Practice . . . . .	1253
Halverson, Wilton L., M.D. Next Steps in the Appraisal of Public Health Work. Landmarks of 1944 . . . . .	8
Hammon, W. McD., M.D., Dr.P.H., and Reeves, W. C., Ph.D. Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. Including Certain Exotic Types . . . . .	994
Hamp, Edward G., DDS. Observations on the Oral Spirochetal Flora Present in Vincent's Infection. Vincent's Infection—A Wartime Disease. . . . .	441
Hardenbergh, W. A., Colonel, Sn.C. Factors in Army Water Quality Control. . . . .	361
Harvey, Verne K., M.D. An Industrial Health Program for Federal Employees. . . . .	239
Has Baltimore the Oldest Health Dept.? Editorial. . . . .	49
Hats Off to the Census Bureau. Editorial. . . . .	381
Health Conferences—1945 Pattern, State. A.P.H.A. . . . .	536
Health Education in Hospitals and Outpatient Departments. Henriette Strauss. . . . .	1175
Health Education in Latin-America, Problems of. German Castillo, M.D., M.P.H. . . . .	1297
Health Education Methods of the Red Cross. H. E. Kleinschmidt, M.D. . . . .	1181
Health Education Prevent Venereal Diseases? Does. The Army's Experience with 8,000,000 Men. Capt. Granville W. Larimore and Lt. Col. Thomas H. Sternberg. . . . .	799
Health Education, Report of the Committee on Problems in Cost Accounting for. H. E. Kleinschmidt, M.D., Chairman. . . . .	1075
Health Education, Report of the Committee on Utilization of Commercial Advertising for David Resnick, Chairman. . . . .	859
Health Education. See: Tips and Tricks for the Practice. Savel Zimand. . . . .	631
Health Films, A Program on. Adolf Nichtenhauser, M.D. . . . .	343
Health Instruction in New York State, School. Editorial. . . . .	513
Health Insurance Plan for Greater New York. Editorial. . . . .	643
Health in the Reconversion Period, Public. Thomas Parran, M.D. . . . .	987
Health Officer and His Personnel, The. William P. Shepard, M.D. . . . .	1163
Health Officers, Effect of the War on the Distribution of Full-time Local. Burnet M. Davis, M.D., and Marion E. Altenderfer. . . . .	1047
Health Practice Indices. See: A Twenty-five Year Review of the Work of the Committee on Administrative Practice. Wilton L. Halverson, M.D. . . . .	1253
Health Problems of the Adolescent. See: Physical Fitness and Health Problems of the Adolescent. . . . .	
Health Program for Federal Employees, An Industrial. Verne K. Harvey, M.D. . . . .	239
Health Programs Under Military Government. Brig. Gen. James S. Simmons, M.C., Col. Thomas B. Turner, M.C., and Col. Ira V. Hiscock, Sn.C. . . . .	35
Health Records, Industrial: The Industrial Hygiene Survey. J. J. Bloomfield. . . . .	559
Health Service in a High School—What It Can Offer. Physical Fitness and Health Problems of the Adolescent. William M. Schmidt, M.D. . . . .	579
Health services. See: Public Health in the Reconversion Period. Thomas Parran, M.D. . . . .	987
Health Services for Migrant Farm Families. Frederick D. Mott, Senior Surgeon (R), U.S.P.H.S. . . . .	308
Health Supervision of the School Child, Sickness as an Index of the Need for. Jean Downes . . . . .	593
Health, Teaching Correctness of Thinking in Matters of. Carl J. Potthoff, M.D., M.P.H. . . . .	1036
Heart Disease in Denver School Children, Prevalence of Rheumatic. Bernice G. Wedum, M.D., Arnold G. Wedum, Ph.D., M.D., and A. L. Beaghtler, M.D. . . . .	1271
Hedrich, A. W., Sc.D. Recent Trend of the Birth Rate. . . . .	321
Heller, J. R., Jr., M.D. Venereal Disease Epidemiology in Wartime. . . . .	1210
Hemolytic Streptococci, Outbreaks Due to Serologically Typed. Scarlet Fever in School-rooms. A. Daniel Rubenstein, M.D., M.P.H., and George E. Foley. . . . .	905
High School, Health Service in a—What It Can Offer. Physical Fitness and Health Problems of the Adolescent. William M. Schmidt, M.D. . . . .	579
Hill-Burton Bill. See: Public Health in the Reconversion Period. Thomas Parran, M.D. . . . .	987
Hill-Burton Bill, The. Editorial. . . . .	380
Hiscock, Col. Ira V., Sn.C., Simmons, Brig. Gen. James S., M.C., and Turner, Col. Thomas B., M.C. Health Programs Under Military Government. . . . .	35
Histoplasma capsulatum. See: Pulmonary Calcification in Negative Reactors to Tuberculin. Amos Christie, M.D., and J. C. Peterson, M.D. . . . .	1131
Historical Summary, War and the Birth Rate—A Brief. Louis I. Dublin, Ph.D. . . . .	315
Hollaender, Alexander, Ph.D., Associate Referee. Disinfection of Air by Ultraviolet Irradiation. See: Report of the Committee on the Examination of Germicides and Antibacterial Agents . . . . .	839
Hollaender, Alexander, Ph.D., Lill, N. D., Lt. Comdr. (MC) USNR, Gershon-Cohen, J., Lt. Comdr. (MC) USNR, Brown, E. W., Capt. (MC) USN, Wheeler, S. M., Lt. (MC) USNR, and Ingraham, H. S., Lt. (MC) USNR. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report. . . . .	457
Home Nursing. See: Health Education Methods of the Red Cross. H. E. Kleinschmidt, M.D. . . . .	1181

	Page
Home Safety. See: Accident Prevention—An Essential Public Health Service. Program Developed by Subcommittee on Accident Prevention, Committee on Administrative Practice, A.P.H.A. Donald B. Armstrong, M.D., Chairman.....	216
Home Safety Activities, Suggested. For Consideration of Local Health Departments. Prepared by Subcommittee on Accident Prevention of the Committee on Administrative Practice, A.P.H.A.....	219
Honolulu, Sanitary Aspects of the Control of the 1913-1944 Epidemic of Dengue Fever in. Wesley E. Gilbertson, P.A. Engineer (R).....	261
Hospital Construction Bill. See: APHA Testimony on Senate Bill 191 Available. Filler See also: The Hill-Burton Bill. Editorial.....	372 380
Hospital Techniques, Symposium on Streamlining. Myron E. Wegman, M.D., Chairman.....	1196
Hospital and Outpatient Departments, Health Education in. Henriette Strauss.....	1175
Hot Springs Conference. See: Future Implications of the Nutritive Value of the American Wartime Diet. Frank G. Boudreau, M.D.....	243
Housing and Public Health. Landmarks of 1944. C.-E. A. Winslow, Dr.P.H.....	18
Housing Inspection—1945 Model. Editorial.....	511
HR 2550. See: New Leadership in Mental Hygiene. Editorial.....	640
H.R. 5257. See: An Industrial Health Program for Federal Employees. Verne K. Harvey, M.D. ....	239
Hygiene and Labor, Industrial. Herbert G. Dyktor.....	480
Hygiene of Housing, Committee on. See: Association Progress in 1944. Abel Wolman, Dr.Eng.....	1
Housing and Public Health. C.-E. A. Winslow, Dr.P.H.....	18
Housing Inspection—1945 Model. Editorial.....	511

## I

Immediate World Task in Public Health, IV, The. Today's Global Frontiers in Public Health. James A. Crabtree, M.D.....	106
Importation of Disease by Men Returning from Overseas Duty, Control Measures Against. Lt. Col. Thomas G. Ward, MC, AUS.....	572
Increased Birth Rate on Future Population, Effect of. P. K. Whelpton.....	323
India as Determined by Spot Agglutination with Absorbed Sera, Distribution of Shigella in. John B. Nelson, Ph.D., Carl Tenbroeck, M.D., and Gustave J. Dammin, Major, MC . . . . .	1282
Indicated State Health Department Participation in the Promotion of Evaluation of Local Health Service. A.P.H.A.....	537
Indices and Standards for Child Health Services. Myron E. Wegman, M.D., and Marjorie T. Bellows . . . . .	715
Industrial Anthrax, Report of the Committee on. Anthrax in the United States, 1939-1943. Henry Field Smyth, M.D., Dr.P.H., Chairman.....	850
Industrial Atmospheric Pollution Nuisances, Study and Control of. Frank N. Stead....	491
Industrial Health Committee, Medical Cooperation with the Fort Greene. Charles F. McCarty, M.D. . . . .	947
Industrial Health Committee, Plan of the Fort Greene. Jacob H. Landes, M.D.....	602
Industrial Health Program for Federal Employees, An. Verne K. Harvey, M.D.....	239
Industrial Health Records: The Industrial Hygiene Survey. J. J. Bloomfield.....	559
Industrial Hygiene and the Expanded Federal-State Vocational Rehabilitation Program. Dean A. Clark, Senior Surgeon (R), USPHS.....	504
Industrial Hygiene and Labor. Herbert G. Dyktor.....	480
Industrial Medical Records. Some Legal Considerations. T. V. McDavitt.....	568
Industrial Nursing. See: The Nurse in Industry. Editorial.....	510
Industrial Vital Statistics, Uses and Value of. Ruth R. Puffer, Dr.P.H.....	553
Industrial Waste Treatment and Control. Loring F. Oeming.....	722
Industry, Nursing Records in. Anna M. Fillmore, R.N., M.P.H.....	221
Infant Mortality in Relation to Month of Birth. Paris R. Eastman.....	913
See: Letter to the Editor. Halbert L. Dunn, M.D.....	1226
Infant, Nutrition and Its Relationship to the Complications of Pregnancy and the Survival of the. Bertha S. Burke. (Followed by Discussion by Harold C. Stuart, M.D.)..	334
Infections, Evaluation of Methods to Control Air-borne. James E. Perkins, M.D.....	891
Influence of Psychological Factors on the Nutrition of Children. Milton J. E. Senn, M.D.	211
Ingram, H. S., Lt. (MC) USNR, Hollander, Alexander, Ph.D., Lill, N. D., Lt. Comdr. (MC) USNR, Gershon-Cohen, J., Lt. Comdr. (MC) USNR, Brown, E. W., Capt. (MC) USN, and Wheeler, S. M., Lt. (MC) USNR. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report.....	457
Insane, Amebiasis in a Hospital for the. William B. Birnkrant, M.D., Morris Greenberg, M.D., Capt. Harry Most, MC, AUS.....	805
Insect Problems in World War II with Special References to the Insecticide DDT. F. C. Bishopp . . . . .	373
Insecticide DDT, Insect Problems in World War II with Special References to the. F. C. Bishopp . . . . .	373
Integrating Nutrition Education and Activities in the School Program. Margaret S. Chaney, Ph.D. . . . .	728

	Page
Inter-American Coöperative Public Health Program. See: Today's Global Frontiers in Public Health. I. A Pattern for Coöperative Public Health. George C. Dunham, M.D., Dr.P.H. . . . .	89
Internal Security Program of the War Department, Lessons Learned from the. Lt. Col. W. H. Weir, Sn.C. . . . .	353
International Collaboration in the Field of Public Health, III. Potentialities of. Today's Global Frontiers in Public Health. Melville D. Mackenzie, M.D., Dr.P.H. . . . .	100
International Health Organizations. See: Today's Global Frontiers in Public Health. I. A Pattern for Coöperative Public Health. George C. Dunham, M.D., Dr.P.H. . . . .	89
Italy, Public Health in. See: Health Programs Under Military Government. Brig. Gen. James S. Simmons, M.C., Col. Thomas B. Turner, MC, and Col. Ira V. Hisecock, Sn.C. . . . .	35

## J

Japanese "B" Encephalitis. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994
Jarcho, Saul, Major, MC. Equal-area Projections and the Azimuthal Equidistant Projection in Maps of Disease. . . . .	1005
Jennings, B. H., M.E., Olson, F. C. W., and Bigg, Edward, M.D. Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization. . . . .	788
Jenss, Rachel M., Sc.D. Statistical Methods in Anthropometric Studies in the Field of Nutritional Research . . . . .	1053
Jersey City, N. J. See: Meeting Maternity Nursing Needs in Wartime. Streamlining Hospital Techniques. Bertha Pieraccini, R. N. . . . .	1196
Johns Hopkins Hospital. See: Health Education in Hospitals and Outpatient Departments. Henriette Strauss. . . . .	1175
Johnson, W. Scott. Engineering Technique Applied to Restaurant Sanitation. . . . .	257
Journal Is 35 Years Old, The. Reginald M. Atwater, M.D. . . . .	1305
Journal, The. See: Association Progress in 1944. Abel Wolman, Dr.Eng. . . . .	1
Juvenile Delinquency. See: Mental Hygiene in a Public Health Program—Its Implications. C. F. McClintic, M.D. . . . .	708

## K

Kantrow, Abraham H., M.D., Baumgartner, Leona, M.D., Ph.D., and Goode, Harry H., B.Ch.E. Service Records and Their Administrative Uses. Experience from a School Health Service . . . . .	1063
Kleinschmidt, H. E., M.D. Health Education Methods of the Red Cross. . . . .	1181
Kleinschmidt, H. E., M.D., Chairman. Report of the Committee on Problems in Cost Accounting for Health Education. . . . .	1075
Kohls, Glen M., Major, Sn.C., AUS, Bell, E. John, Capt., Sn.C., AUS, Blake, Francis G., M.D., Maxey, Kenneth F., M.D., Dr.P.H., and Sadusk, Joseph F., Jr., Col., MC, AUS. Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. . . . .	1121

## L

Labor Becomes Increasingly Health Conscious, Organized. Editorial. . . . .	382
Laboratory Criteria of the Cure of Typhoid Carriers. Roy F. Feemster, M.D., Dr.P.H., and Helen M. Smith. . . . .	368
Labor, Industrial Hygiene and. Herbert G. Dyktor. . . . .	480
Lade, James H., M.D. The Legal Basis for Venereal Disease Control. . . . .	1041
Landes, Jacob H., M.D. Plan of the Fort Greene Industrial Health Committee. . . . .	602
Landmarks of 1944:	
Association Impacts—Past and Present. Louis I. Dublin, Ph.D. . . . .	22
Association Progress in 1944. Abel Wolman, Dr.Eng. . . . .	1
Career Service in Public Health. William P. Shepard, M.D. . . . .	11
Housing and Public Health. C.-E. A. Winslow, Dr.P.H. . . . .	18
Medical Care in a National Health Program. Hugh R. Leavell, M.D., Dr.P.H. . . . .	15
Next Steps in the Appraisal of Public Health Work. Wilton L. Halverson, M.D. . . . .	8
Larimore, Capt. Granville W., and Sternberg, Lt. Col. Thomas H. Does Health Education Prevent Venereal Disease? The Army's Experience with 8,000,000 Men. . . . .	799
Latin-America, Problems of Health Education in. German Castillo, M.D., M.P.H. . . . .	1297
Laundry, A Public Health Role for the. M. E. Barnes, M.D., Dr.P.H. . . . .	1277
Leavell, Hugh R., M.D., Dr.P.H. Medical Care in a National Health Program—Landmarks of 1944. . . . .	15
Legal Basis for Venereal Disease Control, The. James H. Lade, M.D. . . . .	1041
Legal Considerations, Some. Industrial Medical Records. T. V. McDavitt. . . . .	568
Lessons Learned from the Internal Security Program of the War Department. Lt. Col. W. H. Weir, Sn.C. . . . .	353
Letters to the Editor. . . . .	384
Comment on "Infant Mortality in Relation to Month of Birth" by Paris R. Eastman. Halbert L. Dunn, M.D. . . . .	1226
Crumbine, Samuel J., M.D. Puerto Rico Provincial Board of Health Created 1768. . . . .	1226
	384

Letters to the Editor—Continued	Page
Dunn, Halbert L., M.D. Comment on "Infant Mortality in Relation to Month of Birth" by Paris R. Eastman.....	1226
Puerto Rico Provincial Board of Health Created 1768. Samuel J. Crumbine, M.D.....	384
Low, Major Edward A., MAC, and Long, Colonel Edmond R., MC. Tuberculosis in the Armed Forces .....	469
Lice and Typhus and Their Control. See: Insect Problems in World War II with Special References to the Insecticide DDT. F. C. Bishopp.....	373
Lill, N. D., Lt. Comdr. (MC) USNR, Gershon-Cohen, J., Lt. Comdr. (MC) USNR, Brown, E. W., Capt. (MC) USN, Wheeler, S. M., Lt. (MC) USNR, Ingraham, H. S., Lt. (MC) USNR, and Hollender, Alexander, Ph.D. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report.....	457
Local Health Officers, Effect of the War on Distribution of Full-time. Burnet M. Davis, M.D., and Marion E. Altenderfer.....	1047
Local Health Service, Indicated State Health Department Participation in the Promotion of Evaluation of. A.P.H.A. News.....	537
Local Health Units for the Nation. See: A Twenty-five Year Review of the Work of the Committee on Administrative Practice. Wilton L. Halverson, M.D.....	1253
Local Health Units for the Nation. See: 1,200 Local Public Health Departments for the United States. Haven Emerson, M.D., and Martha Luginbuhl, M.A.....	898
Local Health Units. See: A Third of the Nation without Health Protection. Editorial....	952
Local Health Units, Relationship of the U. S. Public Health Service to State and. E. S. Tisdale .....	625
Local Public Health Departments for the United States, 1,200. Haven Emerson, M.D., and Martha Luginbuhl, M.A.....	898
Long, Col. Edmond R., MC, and Lew, Major Edward A., MAC. Tuberculosis in the Armed Forces .....	469
Louse control. See: Treatment of Pediculosis Capitis. Joseph G. Molner, M.D., M.P.H....	1302
Lowry, Oliver H., Ph.D., M.D., and Bessey, Otto A., Ph.D. Biochemical Methods in Nutritional Surveys .....	941
Luginbuhl, Martha, M.A., and Emerson, Haven, M.D. 1,200 Local Public Health Departments for the United States.....	898
Luippold, Major George F. A Proposed Typhoid Immunogenic Unit for Evaluation of Antityphoid Immunizing Substances.....	153
Lumpkin, Margaret. Utilizing Medical Social Service in a Venereal Disease Clinic.....	1185

## M

Mackenzie, Melville D., M.D., D.P.H. Today's Global Frontiers in Public Health. III. Potentialities of International Collaboration in the Field of Public Health.....	100
Making Food Handlers Health Conscious. II: A. Morgan, Jr., M.D., M.P.H., Thomas B. Muse and Albertine McKellar.....	28
Making Public Health Positions More Attractive, On. Joseph W. Mountin, M.D.....	1148
Malaria Control, The Challenge of. Editorial.....	271
Mallmann, W. L., Ph.D., Chairman. Report of the Standard Methods Committee on Examination of Water and Sewage.....	957
Malnutrition. See:	
Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy. William J. Darby, M.D., Ph.D., and D. F. Milam, M.D.....	1014
Statistical Research in Clinical Tests for Nutritional Deficiencies. Dorothy G. Wiedl.....	1168
Malo-Juvern, Felipe, M.D., M.P.H., Payne, George C., M.D., Dr.P.H., and Ortiz-Mariotte, M.D., M.P.H. Control of Typhus Fever in Mexican Villages and Rural Populations Through the Use of DDT.....	1191
Marriage Bells in Seattle. Editorial.....	1321
Maps of Disease, Equal-area Projections and the Azimuthal Equidistant Projection in Saul Jarcho, Major, MC.....	1005
Marshall, J. T. Discussion following "Current Tuberculosis Statistics in the United States" by Mary Dempsey.....	250
Maryland. See: Health Education in Hospitals and Outpatient Departments. Henriette Strauss .....	1175
Massachusetts. See: Laboratory Criteria of the Cure of Typhoid Carriers. Roy F. Feemster, M.D., Dr.P.H., and Helen M. Smith.....	368
Massachusetts State Board of Health. See: Changing Challenges of Public Health. C.-E. A. Winslow, Dr.P.H. ....	191
Massachusetts, The Statistical Approach to the Cancer Problem in. Evelyn A. Potter and Mildred R. Tully.....	485
Massler, Maury, D.D.S. Nutrition and the Oral Tissues.....	923
Maternal and Child Health Problems, Effect of the Increased Birth Rate on. John M. Saunders, M.D. ....	140
Maternity Hospitals, Nursing Techniques in. Streamlining Hospital Techniques. Ruth M. Olson, R.N., and Martha L. Clifford, M.D.....	1199
Maternity Nursing Needs in Wartime, Meeting. Streamlining Hospital Techniques. Bertha Pieraccini, R.N. ....	1196

	Page
Maxey, Kenneth F., M.D., Dr.P.H., Sadusk, Joseph F., Jr., Col. MC, AUS, Kohls, Glen M., Major, Sn.C., AUS, Bell, E. John, Capt., Sn.C., AUS, and Blake, Francis G., M.D. Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea.....	1121
McCarty, Charles F., M.D. Medical Cooperation with the Fort Greene Industrial Health Committee .....	947
McCay, C. M., Lt. Com., H(S), USNR. Nutritional Problems That Arise in Large Scale Cookery .....	143
McClintock, C. F., M.D. Mental Hygiene in a Public Health Program—Its Implications..	708
McDavitt, T. V. Industrial Medical Records. Some Legal Considerations.....	568
McKellar, Albertine, Morgan, H. A., Jr., M.D., M.P.H., and Muse, Thomas B. Making Food Handlers Health Conscious.....	28
Measles, Gamma Globulin for. Editorial.....	732
Meat and Meat Products and Cereal Products. Report of the Committee on Microbiological Examination of Foods. Harry E. Goresline, Ph.D., Chairman.....	820
Medical Care, An Appraisal of a National Program for (After Ample Opportunity to Study the Proposals). W. G. Smillie, M.D.....	587
Medical Care, Background of Current Trends in the Relation of Public Health to. Milton Terris, M.D., M.P.H.....	1287
Medical Care, Constructive Thinking About. Editorial.....	150
Medical Care in a National Health Program. Landmarks of 1944. Hugh R. Leavell, M.D., Dr.P.H. ....	15
Medical Cooperation with the Fort Greene Industrial Health Committee. Charles F. McCarty, M.D. ....	947
Medical Records, Industrial. Some Legal Considerations. T. V. McDavitt.....	568
Medical Social Service in a Venereal Disease Clinic, Utilizing. Margaret Lumpkin.....	1185
Meeting Maternity Nursing Needs in Wartime. Streamlining Hospital Techniques. Bertha Pieraccini, R.N.....	1196
Memphis and Shelby County Tuberculosis Control Program. L. M. Graves, M.D., and F. H. Cole, M.D.....	934
Meningococci, Value of Typing. Sara E. Branham, Ph.D., M.D.....	233
Mental Hygiene. See: Psychosomatic Problems.	
Mental Hygiene in a Public Health Program—Its Implications. C. F. McClintock, M.D.....	708
Mental Hygiene, New Leadership in. Editorial.....	740
Mercator. See: Equal-area Projections and the Azimuthal Equidistant Projection in Maps of Disease. Saul Jarcho, Major, MC.....	1005
Merit System Unit. See:	
Association Progress in 1944. Abel Wolman, Dr.Eng.....	1
Career Service in Public Health. William P. Shepard, M.D.....	11
On Making Public Health Positions More Attractive. Joseph W. Mountin, M.D.....	1148
Message from Thomas Parran, M.D., A. Surgeon General, U.S.P.H.S.....	54
Method for Control of Sanitation in Food Processing Plants, A. Reese H. Vaughn and Thressa C. Stadtman.....	1202
Mexico. See: Control of Typhus Fever in Mexican Villages and Rural Populations Through the Use of DDT. Carlos Ortiz-Mariotte, M.D., M.P.H., Felipe Malo-Juvera, M.D., M.P.H., and George C. Payne, M.D., Dr.P.H.....	1191
Mickle, Friend Lee, Sc.D., Laboratory Chairman. Fabian, F. W., Nutrition Chairman. Report of the Joint Standard Methods Committee on Frozen Desserts and Ingredients..	837
Microbiological Examination of Foods, Report of the Committee on. Meat and Meat Products and Cereal Products. Harry E. Goresline, Ph.D., Chairman.....	820
Migrant Farm Families, Health Services for. Frederick D. Mott, Senior Surgeon (R), U.S.P.H.S. ....	308
Mikol, Edward X., M.D., M.P.H., and Plunkett, Robert E., M.D. Recent Trends in the Early Diagnosis of Tuberculosis.....	1260
Milam, D. F., M.D., and Darby, William J., M.D., Ph.D. Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy.....	1014
Military Fitness, Physical Growth in Childhood and. Antonio Ciocco, Sc.D.....	927
Milk and Milk Products, Report of the Standard Methods Committee on Examination of. Robert S. Breed, Ph.D., Chairman.....	847
Milk. See: The Bacteria "Count"—An Estimate Capable of Accurate Interpretation. James D. Brew, Ph.D., and Robert S. Breed, Ph.D. (Followed by Discussion by Robert S. Breed, Ph.D.).....	683
Milk Sanitation, Basic Essentials of. Editorial.....	50
Military Government, Health Programs Under. Brig. Gen. James S. Simmons, M.C., Col. Thomas B. Turner, M.C., and Col. Ira V. Hiscock, Sn.C.....	35
Minnesota. See: The Point of View of the Public Health Physician. Streamlining Hospital Techniques. Viktor O. Wilson, M.D., M.P.H.....	1202
Mite-borne Typhus, Scrub Typhus. Tsutsugamushi Disease in New Guinea. Francis G. Blake, M.D., Kenneth F. Maxey, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col., MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell, Capt., Sn.C., AUS.....	1121
Moiner, Joseph G., M.D., M.P.H. Treatment of Pediculosis capitis.....	1302
Morales-Otero, Pablo, M.D., and Arbona, Guillermo, M.D., M.P.H. Difficulties in Planning Public Health Programs in Tropical Areas.....	1057
Morbidity Reporting from the Standpoint of National Public Health Activities, Problems of. G. St. J. Perrott.....	698
Morgan, H. A., Jr., M.D., M.P.H., Muse, Thomas B., and McKellar, Albertine. Making Food Handlers Health Conscious.....	28



	Page
Morgan, Lt. Herbert R., MC, AUS. Active Immunization with Purified Somatic Antigens of <i>Eberthella typhosa</i> , <i>Salmonella paratyphi</i> , and <i>Salmonella schottmuelleri</i> .....	614
Mortality in Relation to Month of Birth, Infant. Paris R. Eastman.....	913
Mosquito-Borne Diseases. See: Insect Problems in World War II with Special References to the Insecticide DDT. F. C. Bishopp.....	373
Mosquito Control. See: Sanitary Aspects of the Control of the 1913-1914 Epidemic of Dengue Fever in Honolulu. Wesley E. Gilbertson, P.A. Engineer (R).....	261
Mosquitoes. See: Virus encephalitis.	
Most, Capt. Harry, MC, AUS, Birkkrant, William B., M.D., and Greenberg, Morris, M.D. Amebiasis in a Hospital for the Insane.....	805
Mott, Frederick D., Senior Surgeon (R), U.S.P.H.S. Health Services for Migrant Farm Families .....	308
Mountin, Joseph W., M.D. On Making Public Health Positions More Attractive.....	1148
Mudd, Stuart, M.D., Chairman. Report of the Committee on Examination of Germicides Antibacterial Agents .....	839
Muse, Thomas B., McKellar, Albertine, and Morgan, H. A., Jr., M.D., M.P.H. Making Food Handlers Health Conscious.....	28

## N

National Health Council. See: A Challenge to the Voluntary Health Agency. Editorial..	1070
National Health Program, Medical Care in a. Hugh R. Leavell, M.D., Dr.P.H.....	15
National Program for Medical Care, An Appraisal of a (After Ample Opportunity to Study the Proposals). W. G. Smilie, M.D.....	587
National Public Health Activities, Problems of Morbidity Reporting from the Standpoint of. G. St. J. Perrott.....	698
National Research Council, Sanitary Engineering Report 8. Cross-connections and Back-siphonage Connections Under War Conditions.....	637
Naval Training Center, Ultra-violet Light Control of Air-borne Infections in a. Preliminary Report. S. M. Wheeler, Lt. (MC), USNR, H. S. Ingraham, Lt. (MC), USNR, Alexander Hollaender, Ph.D., N. D. Lill, Lt. Comdr. (MC), USNR, J. Gershon-Cohen, Lt. Comdr. (MC), USNR, and E. W. Brown, Capt. (MC), USN.....	457
Navy. See: Armed Forces.	
Navy, U. S. See: Nutritional Problems That Arise in Large Scale Cookery. Lt. Comdr. C. M. McCay, II(S), USNR.....	143
Necrotic gingivitis. See: Vincent's Infection.	
Nelson, John B., Ph.D., Tenbroeck, Carl, M.D., and Dammin, Gustave J., Major, MC. Distribution of <i>Shigella</i> in India as Determined by Spot Agglutination with Absorbed Sera .....	1282
New-born, Practical Implications of the Epidemiology of the Diarrheal Diseases of the. Streamlining Hospital Techniques. James Watt, Surgeon, USPHS.....	1205
New Developments in Teacher Education. With Implications for Health Education. Maurice E. Troyer, Ph.D.....	1022
New Guinea, Tsutsugamushi Disease in (Scrub Typhus, Mite-borne Typhus). Francis G. Blake, M.D., Kenneth F. Maxey, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col., MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell, Capt., Sn.C., AUS.....	1121
New Leadership in Mental Hygiene. Editorial.....	640

	Page
News from the Field (and Fillers)....	80,
183, 295, 426, 543, 665, 774,	
882, 977, 1105, 1244, 1342	
Administrative Practice, Committee on.	
See: A Salute to the C.A.P.....	544
Advisory Health Group Meets.....	1304
Affiliated Societies, New Officers of....	933
Alaska's Number One Health Problem	1345
Alabama, Allied Health Council Or-	
ganized in .....	887
Alaska Establishes a Department of	
Health .....	1108
Allergy, Seventh Annual Forum on, in	
Pittsburgh. See: Milton J. Rosenau	
Honored .....	296
Allied Health Council Organized in	
Alabama .....	887
America Typhus Commission Medal	
Awarded Dr. Maxey and Dr. Blake..	1248
American Association of University	
Women Fellowships .....	980
American Cancer Society.....	295
American Committee on Maternal Wel-	
fare Seeks Release of Obstetricians	
and Gynecologists .....	1248

	Page
News from the Field (and Fillers)—Cont.	
American Medical Association Offers	
Electrical Transcriptions on Public	
Health .....	1028
American Medical Officers Aid in Fight	
Against Cholera .....	980
American Physicians' Art Association.	
See: Artists and Healers.....	1040
American Red Cross Immune Serum	
Globulin Plan .....	426
American Scientists Aid Egyptians.....	428
American Social Hygiene Association	
Establishes Committee on Inter-	
American Cooperation .....	774
American Statistical Association. See:	
Biometrics Bulletin .....	670
Annual Meeting Postponed, The 74th..	276
APIA Testimony on Senate Bill 191	
Available .....	372
Approved Courses for Student Dieti-	
tions .....	296
Armed Forces Need More Nurses....	80
Army Increases Calories for Overseas	
Combat Rations .....	601
Army Personnel to Receive Influenza	
Inoculations, All .....	1350

News from the Field (and Fillers)—Cont.		Page
Army, Streptomycin Being Studied by U. S. ....		1107
Artists and Healers.....		1040
Associated Hospital Service of New York. See: Blue Cross Privileges for Discharged Service men.....		1351
"Baby Talk" Magazine Announces Health Awards .....		1350
Baltimore, Md. See: Communicable Disease Control Ordinance Enacted..		1115
Baltimore's Demographic Studies.....		1349
Baruch Proposes New Veterans' Medical Setup .....		993
Bauman, James E. See: Dr. Heering Appointed Ohio State Director of Health .....		548
Baumgartner Return from French Mission, Drs. Dublin and.....		1245
Baylor Extends Teaching Facilities for Medical Students.....		82
Bengtson, Dr. Ida. See: Retiring Women Scientists Honored.....		1342
Bevan, Mr. Aneurin. See: New British Minister of Health.....		981
Biennial Conference of the Canadian Home Economics Association.....		774
Biggs Memorial Lectures, Hermann M. Biometrics Bulletin .....		670
Blake, Dr. Francis G. See: America Typhus Commission Medal Awarded Dr. Maxy and Dr. Blake.....		1248
Blood Donor Services, Red Cross Policy Covering Civilian.....		882
Blue Cross Privileges for Discharged Service Men .....		1351
Boards Named for New Health Departments in Illinois.....		776
Borden Award, Mrs. Burke Receives 1945 .....		887
Border Health Conference.....		544
Boudreau, Dr. Frank G. See: Messages from Abroad.....		1344
Brazil, Inter-American Health Activities in .....		1109
Brazil, New School of Public Health in .....		1350
Bread and Flour Enrichment Program, New York State Extends.....		1004
Bristol, Dr. Leverett D., Appointed Commissioner of Health and Welfare in Maine .....		1111
British Minister of Health, New.....		981
British Society of Medical Officers of Health Holds Annual Meeting.....		977
Bronze Star Medal to: Louis L. Feldman.....		1247
Major Israel Weinstein.....		1116
Brooklyn. See: Fort Green Industrial Health .....		484
Bryan, Dr. A. Hughes, Appointed Deputy Director of Health for UNRRA .....		1247
Buchanan, Dr. John C. R. See: First Health Inspector General Named for South Pacific .....		777
Budgeting Nursing Resources, Dr. Parran on .....		242
Bureau of Medical Services in Maryland Burke. Mrs. Bertha Shapley, Receives 1945 Borden Award.....		887
Cabinet Post Urged for Social Welfare Work .....		558
Cadet Nurse Corps Recruitment, U. S. California Health Board Observes Seventy-Fifth Anniversary .....		549

News from the Field (and Fillers)—Cont.		Page
California, University of, Faculty Appointments, School of Public Health		1108
California, X-Ray Survey Center Planned in .....		982
Canadian Home Economics Association, Biennial Conference of the.....		775
Cancer .....		183
Cancer Congress, Cuban National.....		295
Cancer Control in Kansas, New Division of .....		670
Cancer Council Plans Educational Program, National Advisory.....		550
Cancer Council Release, National Advisory .....		882
Cancer Education .....		1086
Cancer Research in Pennsylvania, \$100,000 for .....		1115
Cancer Research, New York, Sloan-Kettering Institute for.....		1113
Cancer Research Program.....		1348
Cancer Society, American.....		293
Cancer Treatment, West Virginia Has New Procedure in Application for....		1114
C.A.P., A Salute to the.....		544
Capital Industry Gives Attention to Employee Health .....		186
Care of Expectant Mothers, Joint Project for .....		429
Cattaraugus County (N. Y.) Tuberculosis Association Celebrates Twenty-Five Years .....		1348
Censuses in Congested Production Areas, Sample .....		440
Charleston County, S. C. See: Health Department Celebrates Twenty-fifth Anniversary .....		1116
Cheese, Food Infection Outbreak Due to .....		883
Cheese Regulations, New York City Adopts New .....		41
Chicago Conference on Tuberculosis..		1116
Chicago Industrial Health Committee..		983
Chicago, University of. See: Institute for Supervisors in Public Health Nursing .....		544
Child Health, Next Steps in Maternal and .....		122
Children's Bureau Plans for the Future .....		256
Child Welfare Information Service Organized .....		99
China. See: American Medical Officers Aid in Fight Against Cholera.....		980
China Project Expands, UNRRA.....		1147
China, UNRRA to Send Teaching Staff to .....		775
Chisholm, Major General G. Brock. See: Lasker Award.....		1347
Cholera, American Medical Officers Aid in Fight Against.....		980
C.I.O. See: Detroit UAW-CIO Health Institute .....		546
City Surveys by Urban League.....		1113
Civilian Hospitals Have Million More Patients .....		731
Cleveland Celebrates Pan American Week .....		548
Cleveland Health Museum, The.....		456
Cleveland Health Museum Expands...		1078
Coggeshall, Capt. Lowell T., Gorgas Medal Awarded .....		1346
Cohn, Dr. Edwin J., Receives Passano Foundation Award .....		549
Coleman, Bernard S. See: Council of National Jewish Tuberculosis Institutions Appoints Director.....		84

News from the Field (and Fillers)—Cont.	Page
Colombia Purchases Health Exhibit, Government of .....	352
Colombia, S. A., Health Museum. See: The Cleveland Health Museum.....	450
Colorado Holds Restaurant Sanitation Seminar .....	517
Colorado Industrial Hygiene Abstracts Available .....	888
Colorado Public Health Association. See: New Officers of Affiliated Societies .....	983
Colorado Reactivates Division of Industrial Hygiene .....	180
Columbia University Offers Course in Hospital Administration .....	982
Commissioned Corps of U. S. Public Health Service to be Branch of Armed Forces .....	904
Communicable Disease Control Ordinance Enacted .....	1115
Conference of Health Officers and Public Health Nurses, Annual, Saratoga Springs, N. Y. See: New York State Cancels Health Conference.....	290
Connecticut Commission on the Care of the Chronically Ill.....	1348
Connecticut, Service Bureau for Returning Medical Officers in.....	770
Continued Education Course for Waterworks Personnel at University of Michigan .....	420
Control of Communicable Diseases, More Official Approval of the.....	950
Coöperation of State Departments in Health Education in Georgia.....	1345
Council of National Jewish Tuberculosis Institutions Appoints Director..	84
Council of Social Agencies. See: Washington Metropolitan Health Council	247
Council on Foods and Nutrition, Oleomargarine and the.....	774
Crippled Children Services, Texas.....	1250
Cuban Doctors Recruited by UNRRA for Service in Europe.....	885
Cuban National Cancer Congress.....	295
DDT for Mosquito Control in the United States, Use of. A joint statement of policy by the U. S. Army and the U. S. Public Health Service.....	608
Death Notices.....78, 180, 189, 292, 298, 423, 432, 552, 662, 674, 769, 782, 877, 890, 986, 1099, 1120, 1240,	1252
Death, United States Committee for Study of Joint Causes of.....	1286
Demographic Studies, Baltimore's.....	1340
Dental Division, Massachusetts Planning New .....	1105
Dental Service in Local Health Units .....	543, 1052
Detroit UAW-CIO Health Institute...	540
Dietitians, Approved Courses for Student .....	290
Diphtheria Epidemics in Europe.....	592
Diphtheria in San Francisco—1945....	775
Doull, Dr. James A., Appointed to Office of International Health Relations .....	1343
Draft, Medical Care Versus the.....	697
Draper, Dr. Warren F., Decorated, Returns to United States.....	1246
Dreisbach, Legion of Merit to Colonel .....	428
Dublin and Baumgartner, Drs., Return from French Mission.....	1245

News from the Field (and Fillers)—Cont.	Page
Dunham, Major General George C., MC, USA, Receives Distinguished Service Medal .....	1109
Retires .....	1240
Education, Fellowships in Health.....	320
Egyptians, American Scientists Aid....	428
Elliot, Dr. Martha M. See: E.M.I.C. Aids 750,000 .....	544
E.M.I.C. Aids 750,000.....	544
Employment of Returning Veterans and Displaced War Workers.....	1340
Employment Service, Post-war Expansion of the A.P.H.A.....	1105
Engineers and Sanitarians in Local Health Service .....	727
Erickson (Dr. Harold M.) Appointed Oregon State Health Officer.....	428
Europe, Diphtheria Epidemics in.....	592
Evans, Dr. Alice. See: Retiring Women Scientists Honored.....	1342
Existing Permissive Health Unit Legislation .....	814
Expectant Mothers, Joint Project for Care of .....	429
"Eye Bank" .....	721
Eye-Bank Council .....	1245
FAO, The .....	1310
Federal Inter-Agency Committee on School Health .....	1248
Feldman, Louis L., Bronze Star Medal to .....	1247
Fellowships, American Association of University Women .....	980
Fellowships in Health Education.....	320
Fellowships in Public Health Available to Veterans .....	1348
Fellowships, National Institute of Health Research .....	983
Fellowship in Public Health Awarded, Mary Pemberton Nourse.....	884
Field Training Center, St. Louis County Organizes .....	184
Fifty Years of Public Service.....	1345
Film Awards, Safety.....	545
Film Equipment Available in Schools of Nursing .....	669
Florida Public Health Association....	85
Food and Agriculture Organization of the United Nations. See: The FAO..	1310
Food Handling, U. S. Indian Service Announces Short Course in.....	775
Food Infection Outbreak Due to Cheese Ford, Edsel, Estate. See: Detroit UAW-CIO Health Institute.....	540
Fort Greene Industrial Health.....	484
French Mission, Drs. Dublin and Baumgartner Return from.....	1245
Full-time Vital Statistics Registrars Recommended—Resolution .....	981
Gamma Globulin. See: American Red Cross Immune Serum Globulin Plan	426
Gamma Globulin for Measles.....	1195
General Federation of Women's Clubs Holds Washington Institute.....	546
General Hospitals Designated as Tropical Disease Centers.....	671
Georgia, Coöperation of State Departments in Health Education in.....	1345
Georgia. See: Proposed Program to Coördinate Health Activities.....	549
Germany, UNRRA to Expand Program in U. S.-Occupied.....	1350
Gorgas Medal Awarded Capt. Coggeshall .....	1346

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Gotaas, Colonel Harold B., Sn.C., USA, Elected President Institute of Inter- American Affairs .....	1246	Indian Service (U.S.) Announces Short Course in Food Handling.....	775
Gets Chilean Order of Merit.....	884	Indiana, Governor Outlines Health Program for .....	549
Government of Colombia Purchases Health Exhibit .....	352	Indiana State Council for Mental Health .....	885
Governor Outlines Health Program for Indiana .....	549	Industrial Health Committee, Chicago..	983
Graduate Course in Industrial Medicine at Long Island.....	1249	Industrial Health Engineering in the Tennessee Valley Authority.....	779
Greek Government, Navy Public Health Unit to Aid.....	636	Industrial Hygiene Abstracts Avail- able, Colorado .....	888
Hall of Fame, Dr. Walter Reed Elected to .....	1318	Industrial Hygiene Created in Ohio, Bureau of .....	777
Harmon General Hospital Is Tropical Disease Center .....	823	Industrial Medical Examinations in South Carolina .....	260
Hawaii Health Committee to Broaden Activities .....	1046	Industrial Medicine at Long Island, Graduate Course in.....	1249
Hawaii Public Health Association Organized .....	884	Influenza Inoculations, All Army Per- sonnel to Receive.....	1350
Health Centers and Schools as War Memorials .....	885	Institute for Supervisors in Public Health Nursing .....	544
Health Center Contest Awards.....	152	Institute in Health Education.....	859
Health Center, New York Acquires Site for .....	586	Institute of Inter-American Affairs, Colonel Gotaas Elected President....	1246
Health Committee to Broaden Activities, Hawaii .....	1046	Institute on Health Practice Evalua- tion at the University of Michigan..	670
Health Education, Fellowships in.....	320	Inter-American Cooperation, American Social Hygiene Association Estab- lishes Committee on.....	774
Health Education in Philadelphia, Program on .....	778	Inter-American Health Activities in Brazil .....	1109
Health Education, Institute in.....	859	International Health Division of the Rockefeller Foundation, Report of...	778
Health Education, Specialists on Local Health Department Staffs.....	804	International health organization. See: Advisory Health Group Meets.....	1304
Health Education Unit, U. S. Army Develops .....	427	International Health Organization, Sen- ator Pepper Proposes Joint Resolu- tion for Formation of.....	1110
Health Education Workshop.....	360	International Health Relations, Dr. Dovell Appointed to Office of.....	1343
Health Exhibit, Government of Colombia Purchases .....	352	International Nursing Bulletin.....	1115
Health Inspector General Named for South Pacific, First.....	777	Iowa State University and Department of Health. See: Tropical Diseases..	776
Health Insurance, Social Security Board Outlines a Policy for.....	567	Ireland, William Freeman Snow Award to General .....	428
Health Museum, The Cleveland.....	456	Italy, Dr. Perkins to Study Health Conditions in .....	977
Health Museum Expands, Cleveland..	1078	Johnson, Arthur M., M.D., Retires as Health Officer of Rochester, N. Y....	547
Health Officers Association Created in Michigan .....	548	Johnston, Lillian J., R.N. See: UNRRA Appoints Chief Nurse of the Health Division .....	1247
Health Unit Legislation, Existing Per- missive .....	814	Joint Project for Care of Expectant Mothers .....	429
Heart Association, New York.....	296	Kamal, Dr. Ahmed M., of Egypt Dele- gate at UNCTO .....	884
Heering, Roger E., M.D., M.P.H., Ap- pointed Ohio State Director of Health .....	548	Kansas, New Division of Cancer Con- trol in .....	670
Hennessey, Lt. Col. Harold R., MC, AUS, Receives Bronze Star Medal....	1248	Kansas, School Health Survey in.....	548
Herman M. Biggs Memorial Lectures..	142	Kellogg, W. K., Foundation. See: Mexico Nutrition Project Renewed..	979
Hiscock, Col. Ira V., Receives Legion of Merit .....	550	Kentucky, Malaria Control Program in .....	671
Hiorowitz, Dr. Sandor. See: Fifty Years of Public Service.....	1345	King, Charles Glenn, Receives Nutrition Award .....	84
Hospital Administration, Columbia Uni- versity Offers Course in.....	982	"Know Your Public Health Nurse ....."	83
Hospital Administrators, Training of..	887	Laboratories Expand, Massachusetts Public Health .....	1110
Hospital Project in New York State, A Regional .....	1342	Laboratory Service in Local Health Departments .....	742
Hospital Ships Now Get Whole Milk, Patients on .....	838	Lasker Award .....	1347
Hospitals Have Million More Patients, Civilian .....	731	Lasker Award in Mental Hygiene, 1945	620
Idaho Public Health Association. See: New Officers of Affiliated Societies..	983	Lasker Foundation Award to Dr. Underwood .....	295
Illinois, Boards Named for New Health Departments in .....	776		
Immune Serum Globulin Plan, Ameri- can Red Cross.....	426		

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Legion of Merit:		Medical Facilities in the Philippine	
to Colonel Dreisbach.....	428	Islands, Status of.....	1013
Col. Ira V. Hilscock Receives.....	550	Medical Officers of Health Hold Annual	
Col. Karl R. Lundeborg, MC, Receives	670	Meeting, British Society of.....	977
Lt. Col. Ralph S. Muckenfuss, MC,		Medical Services in Maryland, Bureau	
Awarded .....	886	of .....	836
Legislating for Local Health Units....	828	Medical Social Work Scholarships....	630
Liberia with Five Year Health Plan,		Medicine Today .....	1346
U.S.P.H.S. Helps .....	84	Mental Clinics for Veterans.....	978
Library of Public Health Education in		Mental Health, Indiana State Council	
West Virginia .....	1116	for .....	885
Local Health Departments, Laboratory		Mental Hygiene, 1945 Lasker Award	
Service in .....	742	in .....	620
Local Health Department Staffs, Health		Merit System Unit Completes 100 Ex-	
Education Specialists on.....	801	aminations, A.P.H.A. ....	84
Local Health Service, Engineers and		Messages from Abroad.....	1344
Sanitarians in .....	727	Metropolitan Life Insurance Co. See:	
Local Health Units, Dental Health		Cancer Education .....	1086
Service in .....	1052	Metropolitan Life Insurance Co. See:	
Local Health Units, Dental Service in	543	Film Equipment Available in Schools	
Local Health Units for the Nation.....	297	of Nursing .....	669
See:		Promotions Among Medical Staff....	428
Existing Permissive Health Unit		Mexico Nutrition Project Renewed....	970
Legislation .....	814	Michigan, Continued Education Course	
More Public Health Nurses Will		for Waterworks Personnel at Uni-	
Be Needed .....	758	versity of .....	420
School Health Service in Local		Michigan, Health Officers Association	
Communities .....	978	Created in .....	548
Local Health Units, Legislating for...	828	Michigan Hospital Commission Changed,	
Long Island College of Medicine. See:		Status of .....	886
Graduate Course in Industrial Medi-		Michigan, Institute on Health Practice	
cine at Long Island.....	1240	Evaluation at the University of....	670
Lundeborg, Colonel Karl R., MC, re-		Michigan Public Health Association...	420
ceives Legion of Merit.....	670	Michigan Society of Neurology and	
Macy Foundation Receives Additional		Psychiatry. See: Mental Clinics for	
Funds for Health Studies.....	1247	Veterans .....	978
Maine, Dr. Bristol Appointed Commis-		Michigan State Health Department	
sioner of Health and Welfare in.....	1111	Creates New Peninsula Office.....	1114
Malaria Control Program in Kentucky	671	Milk, Patients on Hospital Ships Now	
March of Dimes Donations Increased in		Get Whole .....	838
1945 .....	1062	Minnesota, School of Public Health at..	238
Maryland, Bureau of Medical Services		Mississippi Public Health Association	547
in .....	836	Missouri State Board of Health, Ap-	
Maryland Health Officers Hold Twenty-		pointments to .....	1115
Fifth Annual Conference.....	669	More Official Approval of the Control	
Massachusetts Planning New Dental		of Communicable Diseases.....	950
Division .....	1105	More Public Health Nurses Will Be	
Massachusetts Public Health Associa-		Needed .....	758
tion .....	206	Morrison Prize Awarded to Dr. Alex-	
Massachusetts Public Health Labora-		ander-Jackson .....	184
tories Expand .....	1110	Mosquito Control in the United States,	
Mass chest x-ray examination for tuber-		Use of DDT for. A joint statement	
culosis. See: Capital Industry Gives		of policy by the U. S. Army and the	
Attention to Employee Health.....	186	U. S. Public Health Service.....	668
Maternal and Child Health, Next		Motion Picture Committee. See: Safety	
Steps in .....	122	Film Awards .....	515
Maternal Welfare Seeks Release of		Muckenfuss, Lt. Col. Ralph S., M.C.,	
Obstetricians and Gynecologists,		Awarded Legion of Merit.....	886
American Committee on.....	1248	Museum, The Cleveland Health.....	456
Maxey, Dr. Kenneth F. See: America		National Advisory Cancer Council	
Typhus Commission Medal Awarded		Plans Educational Program.....	550
Dr. Maxey and Dr. Blake.....	1248	National Advisory Cancer Council Re-	
McIver, Pearl, R.N. See: National		lease .....	882
Nursing Planning .....	778	National Advisory Health Council of	
Measles, Gamma Globulin for.....	1195	the U. S. Public Health Service....	981
Measles—prophylaxis, modification and		National Committee for Education on	
treatment. See: American Red Cross		Alcoholism, The .....	83
Immune Serum Globulin Plan.....	420	National Foundation for Infantile	
Medical Care in a National Health		Paralysis. See:	
Program. See: APHA Testimony on		March of Dimes Donations Increased	
Senate Bill 191 Available.....	372	in 1945 .....	1062
Medical Care Program, Pediatricians		Medical Social Work Scholarships....	630
Adopt .....	81	National Health and Welfare Retire-	
Medical Care Versus the Draft.....	697	ment Association .....	132, 1180

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
National Health Council Election.....	776	Ohio, Bureau of Industrial Hygiene	
National Institute of Governmental		Created in .....	777
Purchasing Organized .....	130	Ohio Creates Tuberculosis Division....	546
National Institute of Health Research		Ohio, Proposed State Health Center at	
Fellowships .....	983	Columbus .....	1111
National Nursing Planning.....	778	Ohio State Director of Health, Dr.	
National Roster of Scientific and		Heering Appointed .....	548
Specialized Personnel. See: Employ-		Oklahoma Board of Health Formed,	
ment of Returning Veterans and Dis-		New .....	1113
placed War Workers.....	1349	Oleomargarine and the Council on	
National Safety Council. See: Safety		Foods and Nutrition.....	774
Film Awards .....	545	Ontario Deputy Minister of Health,	
National Sanitation Foundation, Ann		Dr. Phair Appointed.....	427
Arbor, Michigan .....	183	Oregon State Health Officer, Dr. Erick-	
National Tuberculosis Association Elects		son Appointed .....	428
New Officers .....	885	Overseas Combat Rations, Army In-	
Navy Public Health Unit to Aid Greek		creases Calories for.....	601
Government .....	636	Panama Canal Department, Venereal	
Negro colleges. See: Institute in		Disease Among Troops of the.....	775
Health Education .....	859	Pan American Sanitary Bureau Essay	
New Division of Cancer Control in		Awards to Latin Americans.....	672
Kansas .....	670	Pan American Week, Cleveland Cele-	
New School of Public Health in Brazil	1350	brates .....	518
New Social Hygiene Laws in 1945....	1244	Parran, Dr., on Budgeting Nursing Re-	
New York City:		sources .....	242
Acquires Site for Health Center....	586	Passano Foundation Award, Dr. Cohn	
Adopts New Cheese Regulations....	41	Receives .....	549
Opens City-Wide Nutrition Clinic..	671	Patients on Hospital Ships Now Get	
A Poliomyelitis Treatment Training		Whole Milk .....	838
Center in .....	1347	Pediatricians Adopt Medical Care Pro-	
Plans Large Post-war Expansion in		gram .....	81
Health Facilities .....	977	Pediatrics, American Academy of. See:	
Public Health Association of.....	774	Next Steps in Maternal and Child	
New York Academy of Medicine. See:		Health .....	122
Medicine Today .....	1346	Penicillin for Civilian Use, Release of..	307
New York Heart Association.....	296	Pennsylvania, \$100,000 for Cancer Re-	
New York State Department of Health.		search in .....	1115
See: Fellowships in Public Health		Pennsylvania Secretary of Health, Lt.	
Available to Veterans.....	1348	Col. Weest Appointed.....	1108
New York State:		Pennsylvania State College. See:	
Adopts Pollution Abatement Resolu-		Health Education Workshop.....	360
tion .....	1113	Pepper, Senator, Proposes Joint Reso-	
A Regional Hospital Project in....	1342	lution for Formation of Interna-	
Cancels Health Conference.....	296	tional Health Organization.....	1110
Extends Bread and Flour Enrich-		Pepper Subcommittee of Senate Issues	
ment Program .....	1004	Interim Report .....	184
Plans Blood Distribution Program..	346	Perkins, Dr. James E., to Study	
Next Steps in Maternal and Child		Health Conditions in Italy.....	977
Health .....	122	Personals.....	86, 187, 297, 429, 550,
Nobel Awards .....	186	672, 779, 888, 983, 1117, 1250,	1351
North Dakota Public Health Associa-		Phair (Dr. John T.) Appointed Ontario	
tion .....	848	Deputy Minister of Health.....	427
North Dakota, Southwestern District		Philadelphia, Program on Health Edu-	
Health Unit Established in.....	1115	cation in .....	778
North Dakota State Department of		Philadelphia, Rheumatic Fever Made	
Health New Staff Appointments....	1249	a Reportable Disease in.....	671
Nourse Fellowship in Public Health		Philippine Islands, Status of Medical	
Offered by Vassar College.....	82	Facilities in the.....	1013
Nourse, Mary Pemberton, Fellowship		Planning the Transition from War to	
in Public Health Awarded.....	884	Peace in Sanitary Engineering.....	667
Nurse's Aide, Recognizing the Services		Poliomyelitis Treatment Training Center	
of the Volunteer .....	1167	in New York City, A.....	1347
Nurses, Post-war Jobs for Public		Pollution Abatement Resolution, New	
Health .....	1346	York State Adopts.....	1113
Nursing Bulletin, International.....	1115	Post-war Expansion in Health Facili-	
Nursing Planning, National.....	778	ties, New York City Plans Large...	977
Nursing Resources, Dr. Parran on		Post-war Expansion of the A.P.H.A.	
Budgeting .....	242	Employment Service .....	1105
Nutrition Clinic, New York City Opens		Post-war Jobs for Public Health	
City-Wide .....	671	Nurses .....	1346
Nutrition Foundation Grants.....	479	Prenatal Examination Laws. See:	
Nutrition Foundation Grants \$127,750		New Social Hygiene Laws in 1945..	1244
for Research .....	80	Prenatal Examination Laws. See:	
Nutrition Project Renewed, Mexico....	979	New Social Hygiene Laws in 1945..	1244
Official Approval of the Control of		Prepare for Winter Now!.....	846
Communicable Diseases, More.....	950		

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Proposed Merger of Health Departments in West Virginia.....	518	Sanitary Engineering, Planning the Transition from War to Peace In....	667
Proposed Program to Coordinate Health Activities .....	549	Sanitary Engineers from Armed Services Is Expedited, Release of.....	980
Proudly We Hail (Channels).....	86	Schneider, Dr. E. C., Retires.....	1111
Psychiatric Service, Veterans'.....	1115	Scholarships in Public Health.....	1116
Public Health Association of New York City .....	774	Scholarships, Medical Social Work.....	630
Public Health Association, North Dakota .....	848	School Health, Federal Inter-Agency Committee on .....	1248
Public Health Cancer Association of America: See: Cancer.....	183	School Health Programs, State and Territorial Health Officers Declare Principles of .....	1346
Public Health Nurses Will Be Needed, More .....	758	School Health Service in Local Communities .....	978
Public Health Society Formed at the University of Pennsylvania.....	80	School Health Survey in Kansas.....	548
Puerto Rico Public Health Association	672	School of Public Health at Minnesota	238
Radio programs. See: American Medical Association Offers Electrical Transcriptions on Public Health....	1028	Schools as War Memorials, Health Centers and .....	885
Rations, Army Increases Calories for Overseas Combat .....	601	Schools of Nursing, Film Equipment Available in .....	669
Recognizing the Services of the Volunteer Nurse's Aide .....	1167	Sciences Award to Dr. Topping, Washington Academy of.....	517
Red Cross. See: Gamma Globulin for Measles .....	1195	Scientific Professions, Training for the Senate Bill 191 Available, APIHA Testimony on .....	372
Red Cross Policy Covering Civilian Blood Donor Services.....	882	Service Bureau for Returning Medical Officers in Connecticut.....	776
Reed, Dr. Walter, Elected to Hall of Fame .....	1318	74th Annual Meeting Postponed, The. Sight Restoration. See: "Eye Bank" .....	721, 1245
Rees, Dr. John Rawlings. See: Lasker Award .....	1347	Simmons, General, Receives the Walter Reed Medal .....	82
Regional Hospital Project in New York State, A .....	1342	Sloan-Kettering Institute for Cancer Research, New York.....	1113
Release of Penicillin for Civilian Use..	307	Snow Award to General Ireland, William Freeman .....	428
Release of Sanitary Engineers from Armed Services Is Expedited.....	980	Social Hygiene Laws in 1945, New....	1244
Reportable Disease, Rheumatic Fever as a .....	922	Social Security Board Outlines a Policy for Health Insurance.....	567
Restaurant Sanitation Seminar, Colorado Holds .....	517	Social Welfare Work, Cabinet Post Urged for .....	558
Retirement Association .....	1180	Social Work Scholarships, Medical....	630
Retirement Association, National Health and Welfare .....	132	Solid Fuels Administration. See: Prepare for Winter Now!.....	846
Retiring Women Scientists Honored..	1342	South Carolina, Industrial Medical Examinations in .....	200
Rheumatic Fever as a Reportable Disease .....	922	South Carolina, State-wide Tuberculosis Program in.....	1114
Rheumatic Fever Made a Reportable Disease in Philadelphia.....	671	South Dakota Public Health Association .....	85
Ringle, Dr., Appointed Washington State Director of Health.....	295	Southern Branch, A.P.H.A., Elects Officers .....	85
Rochester, N. Y., Arthur M. Johnson, M.D., Retires as Health Officer of....	547	South Pacific, First Health Inspector General Named for.....	777
Rockefeller Foundation, Report of International Health Division of the..	778	Southwestern District Health Unit Established in North Dakota.....	1115
Rosenau, Milton J., Honored.....	296	Souza, Dr. G. H., de Paula, of Brazil, Delegate to UNCIO.....	885
Sabin, Dr. Florence R., Trudeau Medal Awarded .....	979	State and Territorial Health Officers Declare Principles of School Health Programs .....	1346
Safety Film Awards.....	545	State and Territorial Health Officers..	186
Saving Permanent Teeth in School Children .....	1281	State Health Department Activities in West Virginia .....	887
St. Francisville, Ill. See: Food Infection Outbreak Due to Cheese.....	883	State Health Officers, 1945.....	665
St. Louis County Organizes Field Training Center .....	184	Correction for South Dakota.....	779
Salute to the C.A.P., A.....	544	Status of Medical Facilities in the Philippine Islands .....	1013
Sample Censuses in Congested Production Areas .....	440	Status of Michigan Hospital Commission Changed .....	886
San Francisco, A Summary of Actions Related to Public Health During United Nations Conference in.....	1106	Stebbins, Ernest Lyman, M.D., M.P.H., Appointed to Johns Hopkins Faculty	1249
San Francisco, Diphtheria in—1945...	775	Stillbirth Certification, Washington State Adopts New.....	1109
Sanitarians in Local Health Service, Engineers and .....	727		

News from the Field (and Fillers)—Cont.	Page	News from the Field (and Fillers)—Cont.	Page
Stitt Receives Tropical Medicine Medal, Admiral . . . . .	210	UNRRA to Send Teaching Staff to China . . . . .	775
Strachan, Miss Louise, Retires from the N.T.A. . . . .	1347	UNRRA for Service in Europe, Cuban Doctors Recruited by . . . . .	885
Streptomycin Being Studied by U. S. Army . . . . .	1107	U. S. Army Develops Health Education Unit . . . . .	427
Student Health Activities . . . . .	1249	U. S.-Mexico Border Public Health Association. See: Border Health Conference . . . . .	544
Summary of Actions Related to Public Health During United Nations Conference in San Francisco, A. . . . .	1106	U. S. Cadet Nurse Corps Recruitment . . . . .	887
Supervisors in Public Health Nursing, Institute for . . . . .	544	U. S. Public Health Service to be Branch of Armed Forces, Commissioned Corps of . . . . .	904
Teachers Lose Court Case Against Required Chest X-Rays (New York) . . . . .	1112	U. S. Public Health Service, National Advisory Health Council of the . . . . .	981
Teeth in School Children, Saving Permanent . . . . .	1281	Urban League, City Surveys by . . . . .	1113
Tennessee Valley Authority, Industrial Health Engineering in the . . . . .	779	Utah Public Health Association. See: New Officers of Affiliated Societies . . . . .	983
Texas Crippled Children Services . . . . .	1250	Veneral Disease Among Troops of the Panama Canal Department . . . . .	775
Topping, Dr. Norman H., Washington Academy of Sciences Award to . . . . .	547	Veterans' Medical Setup, Baruch Proposes New . . . . .	993
Training for the Scientific Professions	979	Veterans, Mental Clinics for . . . . .	978
Training of Hospital Administrators . . . . .	887	Veterans' Psychiatric Service . . . . .	1115
Transcriptions on Public Health, American Medical Association Offers Electrical . . . . .	1028	Vital Statistics Registrars Recommended, Full-time . . . . .	981
Tropical Disease Center, Harmon General Hospital Is . . . . .	823	Vitamins. See: New York State Extends Bread and Flour Enrichment Program . . . . .	1004
Tropical Disease Centers, General Hospitals Designated as . . . . .	671	Wadsworth, Dr. A. B., Retires . . . . .	252
Tropical Diseases . . . . .	776	Warlike Health and Education. See: Pepper Subcommittee of Senate Issues Interim Report . . . . .	184
Tropical Medicine Medal, Admiral Stitt Receives . . . . .	210	Washington Academy of Sciences Award to Dr. Topping . . . . .	547
Trudeau Medal Awarded Dr. Florence R. Sabin . . . . .	979	Washington Metropolitan Health Council . . . . .	247
Tuberculosis. See: Alaska's Number One Health Problem . . . . .	1345	Washington State Adopts New Stillbirth Certification . . . . .	1109
Tuberculosis Association Celebrates Twenty-five Years, Cattaraugus County (N. Y.) . . . . .	1348	Washington State Department of Health, Staff Changes . . . . .	1110
Tuberculosis, Chicago Conference on . . . . .	1116	Washington State Director of Health, Dr. Ringle Appointed . . . . .	295
Tuberculosis Division, Ohio Creates . . . . .	546	Waterworks Personnel at University of Michigan, Continued Education Course for . . . . .	429
Tuberculosis Program in South Carolina, State-wide . . . . .	1114	Weest, Lt. Col. Harry W., Appointed Pennsylvania Secretary of Health . . . . .	1108
Tuberculosis Trends . . . . .	707	Weinstein, Major Israel, Bronze Star Medal to . . . . .	1116
Typhus Commission Medal . . . . .	193	Welfare Information Service Organized, Child . . . . .	99
Typhus Commission Medal Awarded Dr. Maxey and Dr. Blake, America . . . . .	1248	West Virginia, Proposed Merger of Health Departments in . . . . .	548
Typhus Commission Members Decorated	295	Western Reserve Reorganizes Its Teaching in Public Health . . . . .	1111
UAW-CIO Health Institute, Detroit . . . . .	546	West Virginia. See: Scholarships in Public Health . . . . .	1110
Ultra-Violet Disinfection of Enclosed Spaces . . . . .	669	West Virginia Has New Procedure in Application for Cancer Treatment . . . . .	1114
Underwood, Lasker Foundation Award to Dr. . . . .	205	West Virginia, Library of Public Health Education in . . . . .	1116
UNCIO, Dr. Kamal of Egypt Delegate at . . . . .	884	West Virginia State Health Board Increases Scope . . . . .	671
UNCIO, Dr. G. H. de Paula Souza of Brazil Delegate to . . . . .	885	West Virginia, State Health Department Activities in . . . . .	887
United Nations Conference in San Francisco, A Summary of Actions Related to Public Health During . . . . .	1106	Wheeler, Dr. Stafford M., Killed in Action . . . . .	886
United States Committee for Study of Joint Causes of Death . . . . .	1286	Winslow Retires from Yale, Professor	314
UNRRA. See:		Wolman, Abel, Dr. Eng. See: Planning the Transition from War to Peace in Sanitary Engineering . . . . .	667
American Medical Officers Aid in Fight Against Cholera . . . . .	980	Women's Clubs Holds Washington Institute, General Federation of . . . . .	546
Diphtheria Epidemics in Europe . . . . .	592	X-Ray in Health Week . . . . .	1174
Dr. Perkins to Study Health Conditions in Italy . . . . .	977	X-Ray Survey Center Planned in California . . . . .	982
UNRRA Appoints Chief Nurse of the Health Division . . . . .	1247	X-Rays, Teachers Lose Court Case Against Required Chest (New York)	1112
UNRRA Assumes Other Health Functions . . . . .	185		
UNRRA China Project Expands . . . . .	1147		
UNRRA, Dr. Bryan Appointed Deputy Director of Health for . . . . .	1247		
UNRRA to Expand Program in U. S.-Occupied Germany . . . . .	1350		



	Page
Newspapers, Births and the. J. V. DePorte, Ph.D.....	341
New York, N. Y. See: Outbreak of Sodium Nitrite Poisoning. Morris Greenberg, M.D., William B. Birnkrant, M.D., and Joseph J. Schiffner.....	1217
New York City Department of Health. See:	
Amebiasis in a Hospital for the Insane. William B. Birnkrant, M.D., Morris Greenberg, M.D., and Capt. Harry Most, MC, AUS.....	805
Tips and Tricks for the Practitioner. Savel Zimand.....	631
New York, Health Insurance Plan for Greater. Editorial.....	643
New York State. See: Recent Trends in the Early Diagnosis of Tuberculosis. Edward X. Mikol, M.D., M.P.H., and Robert E. Plunkett, M.D.....	1260
New York State. See: The Legal Basis for Venereal Disease Control. James H. Lade, M.D. ....	1041
New York State Department of Health Against Indiscriminate Publicity, Safeguard Adopted by the. Births and the Newspapers. J. V. DePorte, Ph.D.....	341
New York State, School Health Instruction in. Editorial.....	513
Next Steps in the Appraisal of Public Health Work. Landmarks of 1914. Wilton L. Halverson, M.D. ....	8
Nichtenhauser, Adolf, M.D. A Program on Health Films.....	343
1941 Record, The. Editorial.....	1323
North Carolina. See: Field Study of the Prevalence of the Clinical Manifestations of Dietary Inadequacy. William J. Darby, M.D., Ph.D., and D. F. Milam, M.D.....	1014
North Carolina's Reportable Diseases. C. P. Stevick, M.D.....	1029
Nurse in Industry, The. Editorial.....	510
Nursing Needs in Wartime, Meeting Maternity. Streamlining Hospital Techniques. Bertha Pieraccini, R.N.....	1196
Nursing Records in Industry. Anna M. Fillmore, R.N., M.P.H.....	221
Nursing, Relating the Psychosomatic Viewpoint to Public Health. Ruth Gilbert, R.N....	123
Nursing Techniques in Maternity Hospitals. Streamlining Hospital Techniques. Ruth M. Olson, R.N., and Martha L. Clifford, M.D.....	1199
Nutrition and Its Relationship to the Complications of Pregnancy and the Survival of the Infant. Bertha S. Burke. (Followed by Discussion by Harold C. Stuart, M.D.).	331
Nutrition and the Oral Tissues. Maury Massler, D.D.S.....	923
Nutrition Education and Activities in the School Program, Integrating. Margaret S. Chaney, Ph.D. ....	728
Nutrition of Children, Influence of Psychological Factors on the. Milton J. E. Senn, M.D. ....	211
Nutritional Deficiencies, Statistical Research in Clinical Tests for. Dorothy G. Wiehl..	1168
Nutritional Deficiency, The Wide Significance of. Editorial.....	273
Nutritional Problems That Arise in Large Scale Cookery. C. M. McCay, Lt. Com., II(S), USNR ..	143
Nutritional Research, Statistical Methods in Anthropometric Studies in the Field of. Rachel M. Jense, Sc.D.....	1053
Nutritional State of Children in France, Review of the Evidence as to the. Harold C. Stuart, M.D. ....	299
Nutritional Surveys, Biochemical Methods in. Otto A. Bessey, Ph.D., and Oliver H. Lowry, Ph.D., M.D.....	941
Nutritive Value of the American Wartime Diet, Future Implications of the. Frank G. Boudreau, M.D. ....	243

## O

Observations on the Oral Spirochetal Flora Present in Vincent's Infection. Vincent's Infection—A Wartime Disease. Edward G. Hampp, DDS.....	441
Occupational Health Problem? Is Dermatophytosis a Significant. Samuel M. Peek, Medical Director (R), USPHS, and Louis Schwartz, Medical Director, USPHS.....	621
Odors. See: Study and Control of Industrial Atmospheric Pollution Nuisances. Frank M. Stead ..	491
Ooming, Loring F. Industrial Waste Treatment and Control.....	722
Oldest Health Department? Has Baltimore the. Editorial.....	49
Olson, F. C. W., Bigg, Edward, M.D., and Jennings, B. H., M.E. Epidemiologic Observations on the Use of Glycol Vapors for Air Sterilization.....	788
Olson, Ruth M., R.N., and Clifford, Martha L., M.D. Nursing Techniques in Maternity Hospitals. Streamlining Hospital Techniques.....	1199
On Making Public Health Positions More Attractive. Joseph W. Mountin, M.D.....	1148
Oral Spirochetal Flora Present in Vincent's Infection, Observations on the. Vincent's Infection—A Wartime Disease. Edward G. Hampp, DDS.....	441
Oral Tissues, Nutrition and the. Maury Massler, D.D.S.....	923
Organized Labor Becomes Increasingly Health Conscious. Editorial.....	382
Ortiz-Marlotte, Carlos, M.D., M.P.H., Malo-Juvera, Felipe, M.D., M.P.H., and Payne, George C., M.D., Dr.P.H. Control of Typhus Fever in Mexican Villages and Rural Populations Through the Use of DDT.....	1101
Outbreak of Sodium Nitrite Poisoning. Morris Greenberg, M.D., William B. Birnkrant, M.D., and Joseph J. Schiffner.....	1217
Overseas Duty, Control Measures Against Importation of Disease by Men Returning from. Lt. Col. Thomas G. Ward, MC, AUS.....	572

## P

Page

Parran, Thomas, M.D. Public Health in the Reconversion Period.....	987
Parran, Thomas, M.D., Surgeon General, U.S.P.H.S., A Message from.....	54
Pattern for Cooperative Public Health, I. A. Today's Global Frontiers in Public Health. George C. Dunham, M.D., Br.P.H.....	89
Patterson, Raymond S., Ph.D. A Selected Public Health Bibliography with Annotations .....74, 176, 283, 418, 533, 657, 763, 873, 963, 1096, 1234, 1331	1331
Payne, George C., M.D., Dr.P.H., Ortiz-Mariotte, Carlos, M.D., M.P.H., and Malo-Juvera, Felipe, M.D., M.P.H. Control of Typhus Fever in Mexican Villages and Rural Popu- lations Through the Use of DDT.....	1191
Peck, Samuel M., Medical Director (R), USPHS, and Schwartz, Louis, Medical Director, USPHS. Is Dermatophytosis a Significant Occupational Health Problem?.....	621
Pediculosis capitis, Treatment of. Joseph G. Molner, M.D., M.P.H.....	1302
Perkins, James E., M.D. Evaluation of Methods to Control Air-borne Infections.....	891
Perrott, George St. J.: A Comprehensive Training Program for Public Health Personnel.....	1155
Problems of Morbidity Reporting from the Standpoint of National Public Health Activities.....	698
Personals. See: News from the Field.	
Personnel. See: On Making Public Health Positions More Attractive. Joseph W. Moun- tin, M.D. ....	1148
Personnel, A Comprehensive Training Program for Public Health. George St. J. Perrott..	1155
Personnel, The Health Officer and His. William P. Shepard, M.D.....	1163
Peterson, J. C., M.D., and Christie, Amos, M.D. Pulmonary Calcification in Negative Reactors to Tuberculin.....	1131
Phagedenic gingivitis. See: Vincent's Infection.	
Phosphatase Test to Cheese, Application of the. I. A Preliminary Report on Cheddar Type Cheese. Harry Scharer.....	358
Physical Fitness and Health Problems of the Adolescent: Physiological and Emotional Problems of Adolescence. Lawrence K. Frank.....	575
Health Service in a High School—What It Can Offer. William M. Schmidt, M.D.....	579
Evaluation of Adolescents' Health. J. R. Gallagher, M.D.....	584
Physical Growth in Childhood and Military Fitness. Antonio Ciocco, Sc.D.....	927
Physiological and Emotional Problems of Adolescence. Physical Fitness and Health Problems of the Adolescent. Lawrence K. Frank.....	575
Pieraccini, Bertha, R.N. Meeting Maternity Nursing Needs in Wartime. Streamlining Hospital Techniques.....	1190
Plan of the Fort Greene Industrial Health Committee. Jacob H. Landes, M.D.....	603
Planning Public Health Programs in Tropical Areas, Difficulties in. Guillermo Arbona, M.D., M.P.H., and Pablo Morales-Otero, M.D.....	1057
Plunkett, Robert E., M.D., and Mikol, Edward X., M.D., M.P.H. Recent Trends in the Early Diagnosis of Tuberculosis.....	1200
Point of View of the Public Health Physician, The. Streamlining Hospital Techniques. Viktor O. Wilson, M.D., M.P.H.....	1202
Poisoning, Outbreak of Sodium Nitrite. Morris Greenberg, M.D., William B. Birnkrant, M.D., and Joseph J. Schiffner.....	1217
Population, Effect of Increased Birth Rate on Future. P. K. Whelpton.....	326
Post-War Sanitary Engineering Problems, Report of the Committee on. A. H. Fletcher, Chairman.....	751
Potentialities of International Collaboration in the Field of Public Health, III. Today's Global Frontiers in Public Health. Melville D. Mackenzie, M.D., D.P.H.....	100
Potter, Evelyn A., and Tully, Mildred R. The Statistical Approach to the Cancer Prob- lem in Massachusetts.....	485
Potthoff, Carl J., M.D., M.P.H. Teaching Correctness of Thinking in Matters of Health..	1036
Practical Implications of the Epidemiology of the Diarrheal Diseases of the New-born. Streamlining Hospital Techniques. James Watt, Surgeon, USPHS.....	1205
Pregnancy and the Survival of the Infant, Nutrition and Its Relationship to the Com- plications of. Bertha S. Burke. (Followed by Discussion by Harold C. Stuart, M.D.)	334
Preliminary Considerations on the Epidemiology of Ulcerative Gingivostomatitis. Vincent's Infection—A Wartime Disease. H. Trendley Dean, DDS, and Dennis E. Singleton, Jr., DDS.....	433
Preparation of the Public Health Nurse to Meet Psychosomatic Problems in Today's Health Program. Mary C. Connor, R.N.....	133
Prevalence of Rheumatic Heart Disease in Denver School Children. Bernice G. Wedum, M.D., Arnold G. Wedum, Ph.D., and A. L. Beaghtler, M.D.....	1271
Prevalence of the Clinical Manifestations of Dietary Inadequacy, Field Study of the. William J. Darby, M.D., Ph.D., and D. F. Milam, M.D.....	1014
Prevention, Accident—An Essential Public Health Service. Program Developed by Sub- committee on Accident Prevention, Committee on Administrative Practice, A.P.H.A. Donald B. Armstrong, M.D., Chairman.....	216
Problem of Air-borne Infection, The. Editorial.....	951
Problems in Cost Accounting for Health Education, Report of the Committee on. H. E. Kleinschmidt, M.D., Chairman.....	1075
Problems of Dental Economics. Editorial.....	52
Problems of Health Education in Latin-America. German Castillo, M.D., M.P.H.....	1297

	Page
Problems of Morbidity Reporting from the Standpoint of National Public Health Activities. G. St. J. Perrott.....	698
Processing Plants, A Method for Control of Sanitation in Food. Reese H. Vaughn and Thressa G. Stadman.....	1292
Professional Education, A.P.H.A., Declaration by the Committee on. Veterans' Preference in Public Health Agencies of the United States.....	253
Professional Education, Committee on. Proposed Report on the Educational Qualifications of Executives of Voluntary Health Associations. W. P. Shepard, M.D., Chairman.....	499
Professional Relations with Latin America, Committee on. Sec: Association Progress in 1944. Abel Wolman, Dr.Eng.....	1
Program on Health Films, A. Adolf Nichtenhauer, M.D.....	343
Projections and the Azimuthal Equidistant Projection in Maps of Disease, Equal-area. Saul Jarcho, Major, MC.....	1005
Proposed Typhoid Immunogenic Unit for Evaluation of Antityphoid Immunizing Substances, A. Major George F. Luippold.....	153
Psychological Factors on the Nutrition of Children, Influence of. Milton J. E. Senn, M.D.....	211
Psychosomatic Problems in Today's Health Program, Preparation of the Public Health Nurse to Meet. Mary C. Connor, R.N.....	133
Psychosomatic Problems, Public Health Aspects of. Flanders Dunbar, M.D.....	117
Psychosomatic Viewpoint to Public Health Nursing, Relating the. Ruth Gilbert, R.N....	123
Puberty. Sec: Adolescent.	
Public Eating Places. Sec: Making Food Handlers Health Conscious. H. A. Morgan, Jr., M.D., M.P.H., Thomas B. Muse, and Albertine McKellar.....	28
Public Health Departments for the United States, 1,200 Local. Haven Emerson, M.D., and Martha Luginbuhl, M.A.....	893
Public Health. Sec: Today's Global Frontiers in Public Health.	
Public Health Activities, Problems of Morbidity Reporting from the Standpoint of National. G. St. J. Perrott.....	698
Public Health Aspects of Psychosomatic Problems. Flanders Dunbar, M.D.....	117
Public Health Bibliography. Sec: A Selected Public Health Bibliography with Annotations.	
Public Health, Career Service in. William P. Shepard, M.D.....	11
Public Health, Changing Challenges of. C.-D. A. Winslow, Dr.P.H.....	101
Public Health Degrees and Certificates. Sec: Too Many Degrees. Editorial.....	163
Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year, 1944-1945. Report of the Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	1311
Public Health Education Section, Committee List. Addition. A.P.H.A.....	540
Public Health, Housing and. C.-D. A. Winslow, Dr.P.H.....	18
Public Health in the Reconversion Period. Thomas Parran, M.D.....	987
Public Health Laboratories, The Expanding Scope of. Editorial.....	275
Public Health Law. Sec: The Legal Basis for Venereal Disease Control. James H. Lade, M.D.....	1041
Public Health Nurse to Meet Psychosomatic Problems in Today's Health Program, Preparation of the. Mary C. Connor, R.N.....	133
Public Health Nursing, Relating the Psychosomatic Viewpoint to. Ruth Gilbert, R.N....	123
Public Health Personnel. Sec: The Health Officer and His Personnel. William P. Shepard, M.D.....	1163
Public Health Personnel, A Comprehensive Training Program for. George St. J. Perrott.....	1153
Public Health Physician, The Point of View of the. Streamlining Hospital Techniques. Viktor O. Wilson, M.D., M.P.H.....	1202
Public Health Positions More Attractive, On Making. Joseph W. Mountin, M.D.....	1148
Public Health Program, Mental Hygiene in a—Its Implications. C. F. McClintic, M.D....	708
Public Health Programs in Tropical Areas, Difficulties in Planning. Guillermo Arbona, M.D., M.P.H., and Pablo Morales-Otero, M.D.....	1057
Public Health Role for the Laundry, A. M. E. Barnes, M.D., Dr.P.H.....	1277
Public Health Service Act. Sec: The Hill-Burton Bill. Editorial.....	380
Public Health Work, Next Steps in the Appraisal of. Wilton L. Halverson, M.D.....	8
Puerto Rico. Sec: Difficulties in Planning Public Health Programs in Tropical Areas. Guillermo Arbona, M.D., M.P.H., and Pablo Morales-Otero, M.D.....	1057
Puerto Rico Provincial Board of Health Created 1768. Samuel J. Crumblin, M.D. Letter to the Editor.....	384
Puffer, Ruth R., Dr.P.H. Uses and Value of Industrial Vital Statistics.....	553
Pulmonary Calcification in Negative Reactors to Tuberculin. Angus Christie, M.D., and J. C. Peterson, M.D.....	1131
"Putrid mouth." Sec: Vincent's Infection.	

## Q

Qualifications of Executives of Voluntary Health Associations, Proposed Report on the Educational. Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	499
Qualifications of Health Officers, Proposed Report on the Educational. Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	42

	Page
Qualifications of Public Health Dentists. Proposed Report on the Educational. Committee on Professional Education. W. P. Shepard, M.D., Chairman.....	45
R	
Rabbit Serum, Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune. Joseph Zichis, Ph.D., and Howard J. Shaughnessy, Ph.D.....	815
Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. Including Certain Exotic Types. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994
Recent Trend of the Birth Rate. A. W. Hedrich, Sc.D.....	321
Recent Trends in the Early Diagnosis of Tuberculosis. Edward X. Mikol, M.D., M.P.H., and Robert E. Plunkett, M.D.....	1260
Reconversion Period, Public Health in the. Thomas Parran, M.D.....	987
Records. Editorial . . . . .	955
Records and Their Administrative Uses, Service. Experience from a School Health Service. Abraham H. Kantrow, M.D., Leona Baumgartner, M.D., Ph.D., and Harry H. Goode, B. Ch.E.....	1063
Red Cross, Health Education Methods of the. H. E. Kleinschmidt, M.D.....	1181
Red Cross Volunteer Nurse Aides. See: Meeting Maternity Nursing Needs in Wartime. Streamlining Hospital Techniques. Bertha Pieraccini, R.N.....	1196
Reeves, W. C., Ph.D., and Hammon, W. McD., M.D., Dr.P.H. Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. Including Certain Exotic Types . . . . .	994
Regional Health Organization in the Far East, II. Today's Global Frontiers in Public Health. Szeming Sze, M.D.....	96
Rehabilitation Program, Industrial Hygiene and the Expanded Federal-State Vocational. Dean A. Clark, Senior Surgeon (R). USPHS.....	504
Relating the Psychosomatic Viewpoint to Public Health Nursing. Ruth Gilbert, R.N....	123
Relationship of the U. S. Public Health Service to State and Local Health Units. E. S. Tisdale . . . . .	625
Reportable Diseases, North Carolina's. C. P. Stevick, M.D.....	1029
Reporting Area for Health Practices, Announcement of.....	287
Reporting Area for Health Practices. See: Indicated State Health Department Participation in the Promotion of Evaluation of Local Health Service. A.P.H.A.....	537
Reporting of Vincent's Infection by State Health Departments. Vincent's Infection—A Wartime Disease. Carl L. Sebelius, DDS, MPH.....	451
Reports of Committees. See: Committees.	
Representatives of the American Public Health Association to Other Organizations and Committees for 1945.....	405
Research in Clinical Tests for Nutritional Deficiencies, Statistical. Dorothy G. Wiehl....	1168
Resnick, David, Chairman. Report of the Committee on Utilization of Commercial Advertising for Health Education.....	859
Respiratory Disease, Role of $\beta$ -Hemolytic Streptococci in Common. Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Presented by Capt. Elias Strauss, M.C.....	675
Respiratory Infections. See: Evaluation of Methods to Control Air-borne Infections. James E. Perkins, M.D.....	891
Restaurant Sanitation, Engineering Technique Applied to. W. Scott Johnson.....	237
Review Articles—1945—Requested by Editorial Board:	
Evaluation of Methods to Control Air-borne Infections. James E. Perkins, M.D.....	891
Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. Francis G. Blake, M.D., Kenneth F. Maxcy, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col., MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell, Capt., Sn.C., AUS.....	1121
Review of the Evidence as to the Nutritional State of Children in France. Harold C. Stuart, M.D. . . . .	299
Rheumatic Heart Disease in Denver School Children, Prevalence of. Bernice G. Wedum, M.D., Arnold G. Wedum, Ph.D., M.D., and A. L. Beaghler, M.D.....	1271
Rickettsial Diseases, Applications of the Complement-Fixation Test in the Study of. Ida A. Bengtson, Ph.D.....	701
Robertson, O. H., M.D., Associate Referee. Disinfection of Air by Germicidal Vapors and Mists. See: Report of the Committee on Examination of Germicides and Antibacterial Agents . . . . .	839
Rocky Mountain spotted fever. See: Application of the Complement-Fixation Test in the Study of Rickettsial Diseases. Ida A. Bengtson, Ph.D.....	701
Role of $\beta$ -Hemolytic Streptococci in Common Respiratory Disease. Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Presented by Capt. Elias Strauss, M.C. . . . .	675
Roosevelt, Franklin Delano. Editorial.....	509
Rubenstein, A. Daniel, M.D., M.P.H., and Foley, George E. Scarlet Fever in Schoolrooms. Outbreaks Due to Serologically Typed Hemolytic Streptococci.....	905
Russian Spring-Summer Encephalitis. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994

Sadusk, Joseph F., Jr., Col., MC, AUS, Kohls, Glen M., Major, Sn.C., AUS, Bell, E. John, Capt., Sn.C., AUS, Blake, Francis G., M.D., and Maxey, Kenneth F., M.D., Dr.P.H. Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea.....	1121
Safety Activities, Suggested Home, For Consideration of Local Health Departments, Prepared by Subcommittee on Accident Prevention of the Committee on Administrative Practice, A.P.H.A.....	219
St. Louis, Mo. See: Utilizing Medical Social Service in a Venereal Disease Clinic. Margaret Lumpkin.....	1185
St. Louis Type Encephalitis. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D.....	994
Salmonella paratyphi, and Salmonella schottmuelleri, Active Immunization with Purified Somatic Antigens of Eberthella typhosa. Lt. Herbert R. Morgan, MC, AUS.....	614
Salmonella schottmuelleri, Active Immunization with Purified Somatic Antigens of Eberthella typhosa, Salmonella paratyphi, and. Lt. Herbert R. Morgan, MC, AUS...	614
Salmonellosis, Shigellosis and. Editorial.....	641
Salt. See: Outbreak of Sodium Nitrite Poisoning. Morris Greenberg, M.D., William B. Birnkrant, M.D., and Joseph J. Schiffner.....	1217
Sampson, N. Y., U. S. Naval Training Center. See: Ultraviolet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report. S. M. Wheeler, Lt. (MC), USNR, H. S. Ingraham, Lt. (MC), USNR, Alexander Hollender, Ph.D., N. D. Lill, Lt. Comdr. (MC), USNR, J. Gershon-Cohen, Lt. Comdr. (MC), USNR, and E. W. Brown, Capt. (MC), USN.....	457
San Francisco Security Conference. See: Shall We Declare War at San Francisco? Editorial.....	379
Sanitary Aspects of the Control of the 1913-1941 Epidemic of Dengue Fever in Honolulu. Wesley D. Gilbertson, P.A. Engineer (R).....	261
Sanitary Engineering Problems, Report of the Committee on Post-War. A. H. Fletcher, Chairman.....	751
Sanitary Engineering Report 8, National Research Council. Cross-connections and Back-Siphonage Connections Under War Conditions.....	637
Sanitation, Engineering Technique Applied to Restaurant. W. Scott Johnson.....	257
Sanitation in Food Processing Plants, A Method for Control of. Reese H. Vaughn and Thressa C. Stadman.....	1292
Saunders, John M., M.D. Effect of the Increased Birth Rate on Maternal and Child Health Problems.....	140
Scarlet Fever in Schoolrooms. Outbreaks Due to Serologically Typed Hemolytic Streptococci. A. Daniel Rubenstein, M.D., M.P.H., and George E. Foley.....	905
Scharer, Harry. Application of the Phosphatase Test to Cheese. 1. A Preliminary Report on Cheddar Type Cheese.....	358
Schiffner, Joseph J., Greenberg, Morris, M.D., and Birnkrant, William B., M.D. Outbreak of Sodium Nitrite Poisoning.....	1217
Schmidt, William M., M.D. Health Service in a High School—What It Can Offer. Physical Fitness and Health Problems of the Adolescent.....	570
School Child, Sickness as an Index of the Need for Health Supervision of the. Jean Downes.....	593
School Health. See: New Developments in Teacher Education. With Implications for Health Education. Maurice E. Troyer, Ph.D.....	1022
The Test of King Solomon. Editorial.....	1222
School Health Instruction in New York State. Editorial.....	513
School Health Service, Experience from a. Service Records and Their Administrative Uses. Abraham H. Kantrow, M.D., Leona Baumgartner, M.D., Ph.D., and Harry H. Goode, B.Ch.E.....	1063
School Program, Integrating Nutrition Education and Activities in the. Margaret S. Chaney, Ph.D.....	728
Schoolrooms, Scarlet Fever in. Outbreaks Due to Serologically Typed Hemolytic Streptococci. A. Daniel Rubenstein, M.D., M.P.H., and George E. Foley.....	905
Schools of Public Health, Accreditation of. Editorial.....	953
Schwartz, Louis, Medical Director, USPHS, and Peck, Samuel M., Medical Director (R), USPHS. Is Dermatophytosis a Significant Occupational Health Problem?.....	621
"Scrub Typhus." Editorial.....	1221
Scrub Typhus, Mite-borne Typhus. Tsutsugamushi Disease in New Guinea. Francis G. Blake, M.D., Kenneth F. Maxey, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col., MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell Capt., Sn.C., AUS.....	1121
Seattle, Marriage Bells in. Editorial.....	1321
Sebellius, Carl L., DDS, MPH. Reporting of Vincent's Infection by State Health Departments. Vincent's Infection—A Wartime Disease.....	451
Section Councils, 1944-1945, American Public Health Association.....	386
Seeing Eye in Tuberculosis Control, The. Editorial.....	1224
Selected Public Health Bibliography with Annotations, A. Raymond S. Patterson, Ph.D.....	74, 176, 283, 418, 533, 657, 763, 873, 963, 1096, 1234, 1331

	Page
Selective Service. See: Physical Growth in Childhood and Military Fitness. Antonio Ciocco, Sc.D. . . . .	927
Selective Service Registrants—Causes of Rejection. See: Physical Fitness and Health Problems of the Adolescent. . . . .	380
Senate Bill 191. See: The Hill-Burton Bill. Editorial. . . . .	211
Senn, Milton J. E., M.D. Influence of Psychological Factors on the Nutrition of Children Service Records and Their Administrative Uses. Experience from a School Health Service. Abraham H. Kantrow, M.D., Leona Baumgartner, M.D., Ph.D., and Harry H. Goode, B.Ch.E. . . . .	1063
74th Annual Meeting Postponed, The. . . . .	276
Sexton, Anna M. Archivist—1944, Report of the. . . . .	849
Shall We Declare War at San Francisco? Editorial. . . . .	379
Shaughnessy, Howard J., Ph.D., and Zickis, Joseph, Ph.D. Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum. . . . .	815
Sheephead Bay, N. Y., USPHS Hospital. See: Preliminary Consideration on the Epidemiology of Ulcerative Gingivostomatitis. Vincent's Infection—A Wartime Disease. H. Trendley Dean, DDS, and Dennis E. Singleton, Jr., DDS. . . . .	433
Shelby County Tuberculosis Control Program, Memphis and. L. M. Graves, M.D., and F. H. Cole, M.D. . . . .	934
Shellfish, Report of the Committee on. L. M. Fisher, C.E., Chairman. . . . .	738
Shepard, William P., M.D. See: Career Service in Public Health, Landmarks of 1944. . . . .	11
The Health Officer and His Personnel. . . . .	1163
Shepard, W. P., M.D., Chairman. Committee on Professional Education: Proposed Report on the Educational Qualifications of Health Officers. . . . .	42
Proposed Report on the Educational Qualifications of Public Health Dentists. . . . .	45
Proposed Report on the Educational Qualifications of Executives of Voluntary Health Associations . . . . .	499
Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year 1944-1945. . . . .	1311
Shigella in India as Determined by Spot Agglutination with Absorbed Sera, Distribution of. John B. Nelson, Ph.D., Carl Tenbroeck, M.D., and Gustave J. Dammin, Major, MC . . . . .	1232
Shigellosis and Salmonellosis. Editorial. . . . .	641
Sickness as an Index of the Need for Health Supervision of the School Child. Jean Downes . . . . .	593
Silica, Aluminum vs. Editorial. . . . .	736
Silicosis. See: Aluminum vs. Silica. Editorial. . . . .	736
Simmons, Brig. Gen. James S., M.C., Turner, Col. Thomas B., M.C., and Hiscock, Col. Ira V., Sn.C. Health Programs Under Military Govt. . . . .	35
Singleton, Dennis E., Jr., DDS, and Dean, H. Trendley, DDS. Preliminary Considerations on the Epidemiology of Ulcerative Gingivostomatitis. Vincent's Infection—A Wartime Disease . . . . .	433
Smillie, W. G., M.D. An Appraisal of a National Program for Medical Care. (After Ample Opportunity to Study the Proposals.) . . . . .	587
Smith, Helen M., and Feemster, Roy F., M.D., Dr.P.H. Laboratory Criteria of the Cure of Typhoid Carriers . . . . .	368
Smoke. See: Study and Control of Industrial Atmospheric Pollution Nuisances. Frank M. Stead . . . . .	491
Smyth, Henry Field, M.D., Dr.P.H., Chairman. Report of the Committee on Industrial Anthrax. Anthrax in the United States, 1939-1943. . . . .	850
Social Security Amendments. See: The Wagner Bill of 1945. Editorial. . . . .	824
Social Service in a Venereal Disease Clinic, Utilizing Medical. Margaret Lumpkin. . . . .	1185
Sodium Nitrite Poisoning, Outbreak of. Morris Greenberg, M.D., William B. Birnkrant, M.D., and Joseph J. Schiffner. . . . .	1217
Somatic Antigens of Eberthella typhosa, Salmonella paratyphi, and Salmonella schottmuelleri, Active Immunization with Purified. Lt. Herbert R. Morgan, MC, AUS. . . . .	614
Souza, G. H. de Paula, M.D. Discussion. Today's Global Frontiers in Public Health. . . . .	111
Spirochetal Flora Present in Vincent's Infection, Observations on the Oral. Vincent's Infection—A Wartime Disease. Edward G. Hampp, DDS. . . . .	441
Stadtman, Thressa C., and Vaughn, Reese H. A Method for Control of Sanitation in Food Processing Plants. . . . .	1292
Standard Methods Committee on Examination of Milk and Milk Products, Report of Committee on. Robert S. Breed, Ph.D., Chairman. . . . .	847
Joint Editorial Committee, Report of the. . . . .	847
Standard Methods for the Examination of Water and Sewage. Summary of Recommended Changes for the Ninth Edition. . . . .	1335
Standards for Child Health Services, Indices and. Myron E. Wegman, M.D., and Marjorie T. Bellows . . . . .	715
State and Local Health Units, Relationship of the U. S. Public Health Service to. E. S. Tisdale . . . . .	625
State and Territorial Health Officers. See: A Comprehensive Training Program for Public Health Personnel. George St. J. Perrott. . . . .	1155
State and Territorial Health Officers. See: The Health Officer and His Personnel. William P. Shepard, M.D. . . . .	1163
State Health Conferences—1945 Pattern, A.P.H.A. . . . .	536

	Page
State Health Departments, Reporting of Vincent's Infection by. Vincent's Infection—A Wartime Disease. Carl L. Sebellius, DDS, MPH.....	451
Statistical Approach to the Cancer Problem in Massachusetts, The. Evelyn A. Potter and Mildred R. Tully.....	485
Statistical Methods in Anthropometric Studies in the Field of Nutritional Research. Rachel M. Jenss, Sc.D.....	1053
Statistical Research in Clinical Tests for Nutritional Deficiencies. Dorothy G. Wiehl.....	1168
Statistics, Uses and Value of Industrial Vital. Ruth R. Puffer, Dr.P.H.....	553
Stead, Frank M. Study and Control of Industrial Atmospheric Pollution Nuisances.....	491
Sternberg, Lt. Col. Thomas H., and Larimore, Captain Granville W. Does Health Educa- tion Prevent Venereal Disease? The Army's Experience with 8,000,000 Men.....	709
Stevick, C. P., M.D. North Carolina's Reportable Diseases.....	1029
Stomatitis, ulcerative. See: Vincent's Infection.	
Strauss, Capt. Elias, M.C., Presented by. Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Role of $\beta$ -Hemolytic Streptococci in Common Respiratory Disease....	675
Strauss, Henriette. Health Education in Hospitals and Outpatient Departments.....	1175
Streamlining Hospital Techniques. Myron E. Wegman, M.D., Chairman.....	1196
Meeting Maternity Nursing Needs in Wartime. Bertha Pieraccini, R.N.....	1196
Nursing Techniques in Maternity Hospitals. Ruth M. Olson, R.N., and Martha L. Clifford, M.D. ....	1199
The Point of View of the Public Health Physician. Viktor O. Wilson, M.D., M.P.H.....	1202
Practical Implications of the Epidemiology of the Diarrheal Diseases of the New- born. James Watt, Surgeon, USPHS.....	1205
Streptococci in Common Respiratory Disease, Role of $\beta$ -Hemolytic. Commission on Acute Respiratory Diseases, Fort Bragg, N. C. Presented by Capt. Elias Strauss, M.C.....	675
Stuart, Harold C., M.D. See:	
Discussion following "Nutrition and Its Relationship to the Complications of Pregnancy and the Survival of the Infant" by Bertha S. Burke.....	330
Review of the Evidence as to the Nutritional State of Children in France.....	299
Study and Control of Industrial Atmospheric Pollution Nuisances. Frank M. Stead....	491
Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyper- immune Rabbit Serum. Joseph Zichis, Ph.D., and Howard J. Shaughnessy, Ph.D....	815
Suggested Home Safety Activities. For Consideration of Local Health Departments. Prepared by Subcommittee on Accident Prevention of the Committee on Administra- tive Practice, A.P.H.A.....	219
Superchlorination and "Break-Point" Chlorination. Editorial.....	733
Sze, Szeming, M.D. II. Regional Health Organization in the Far East. Today's Global Frontiers in Public Health.....	96
T	
Taylor, Margery P., Wineman, Margaret A., Fair, Gordon M., and Chang, Shih Lu. Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents..	228
Teacher Education, New Developments in. With Implications for Health Education. Maurice E. Troyer, Ph.D.....	1022
Teaching Correctness of Thinking in Matters of Health. Carl J. Potthoff, M.D., M.P.H....	1036
Teeth. See: Nutrition and the Oral Tissues. Maury Massler, D.D.S.....	923
Tenbroeck, Carl, M.D., Dammin, Gustave J., Major, MC, and Nelson, John B., Ph.D. Distribution of Shigella in India as Determined by Spot Agglutination with Absorbed Sera .....	1282
Tennessee. See: Memphis and Shelby County Tuberculosis Control Program. L. M. Graves, M.D., and F. H. Cole, M.D.....	934
Terris, Milton, M.D., M.P.H. Background of Current Trends in the Relation of Public Health to Medical Care.....	1287
Test of King Solomon, The. Editorial.....	1222
Third of the Nation without Health Protection, A. Editorial.....	952
35 Years Old, The Journal Is. Reginald M. Atwater, M.D.....	1305
Three "R's" of Administration. Editorial.....	826
Ticks. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encepha- litis. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D.....	994
Tips and Tricks for the Practice. Savel Zimand.....	631
Tisdale, E. S. Relationships of the U. S. Public Health Service to State and Local Health Units .....	625
Today's Global Frontiers in Public Health:	
I. A Pattern for Cooperative Public Health. George C. Dunham, M.D., Dr.P.H.....	89
II. Regional Health Organization in the Far East. Szeming Sze, M.D.....	96
III. Potentialities of International Collaboration in the Field of Public Health. Melville D. Mackenzie, M.D., D.P.H.....	100
IV. The Immediate World Task in Public Health. James A. Crabtree, M.D.....	106
Discussion. G. H. de Paula Souza, M.D., Karl Evang, M.D.....	111
Too Many Degrees. Editorial.....	103
Training Program for Public Health Personnel, A Comprehensive. George St. J. Perrott..	1155
Treatment of Pediculosis capitis. Joseph G. Molner, M.D., M.P.H.....	1302
Trend of the Birth Rate, Recent. A. W. Hedrich, Sc.D.....	321

	Page
Trends in the Relation of Public Health to Medical Care, Background of Current. Milton Terris, M.D., M.P.H.	1287
Tricks for the Practice, Tips and. Savel Zimand	631
Tropical Areas, Difficulties in Planning Public Health Programs in. Guillermo Arbona, M.D., M.P.H., and Pablo Morales-Otero, M.D.	1057
Tropical Diseases. See: Control Measures Against Importation of Disease by Men Returning from Overseas Duty. Lt. Col. Thomas G. Ward, MC, AUS.	572
Troyer, Maurice E., Ph.D. New Developments in Teacher Education. With Implications for Health Education.	1022
Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. Francis G. Blake, M.D., Kenneth F. Maxey, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col., MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell, Capt., Sn.C., AUS.	1121
Tuberculin, Pulmonary Calcification in Negative Reactors to. Amos Christie, M.D., and J. C. Peterson, M.D.	1131
Tuberculosis, Recent Trends in the Early Diagnosis of. Edward X. Mikol, M.D., M.P.H., and Robert B. Plunkett, M.D.	1260
Tuberculosis. See: Pulmonary Calcification in Negative Reactors to Tuberculin. Amos Christie, M.D., and J. C. Peterson, M.D.	1131
Tuberculosis Control Program, Memphis and Shelby County. L. M. Graves, M.D., and F. H. Cole, M.D.	934
Tuberculosis Control, The Seeing Eye in. Editorial.	1224
Tuberculosis in the Armed Forces. Col. Esmond R. Long, MC, and Major Edward A. Lew, MAC	469
Tuberculosis Mortality in England and Certain Other Countries During the Present War. James A. Doull, M.D.	783
Tuberculosis Statistics in the United States, Current. Mary Dempsey. (Followed by Discussion by J. T. Marshall.)	248
Tuberculosis, World War I and. A Statistical Summary and Review. Godias J. Drolet.	689
Tully, Mildred R., and Potter, Evelyn A. The Statistical Approach to the Cancer Problem in Massachusetts.	485
Turner, Col. Thomas B., M.C., Hiscock, Col. Ira V., Sn.C., and Simmons, Brig. Gen. James S., M.C. Health Programs Under Military Government.	35
1,200 Local Public Health Departments for the United States. Haven Emerson, M.D., and Martha Luginbuhl, M.A.	898
Twenty-five Year Review of the Work of the Committee on Administrative Practice, A. Wilton L. Halverson, M.D.	1253
Typhoid Carriers, Laboratory Criteria of the Cure of. Roy F. Feemster, M.D., Dr.P.H., and Helen M. Smith.	368
Typhoid Fever. See: Active Immunization with Purified Somatic Antigens of Ebertheila typhosa, Salmonella paratyphi, and Salmonella schottmuelleri. Lt. Herbert R. Morgan, MC, AUS.	614
Typhoid Immunogenic Unit for Evaluation of Antityphoid Immunizing Substances, A Proposed. Major George F. Luippold.	153
Typhus. See:	
Applications of the Complement-Fixation Test in the Study of Rickettsial Diseases. - Ida A. Bengtson, Ph.D.	701
"Scrub Typhus." Editorial.	1221
Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. Francis G. Blake, M.D., Kenneth F. Maxey, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col. MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell, Capt., Sn.C., AUS.	1121
Typhus Commission, U.S.A. See: Tsutsugamushi Disease (Scrub Typhus, Mite-borne Typhus) in New Guinea. Francis G. Blake, M.D., Kenneth F. Maxey, M.D., Dr.P.H., Joseph F. Sadusk, Jr., Col., MC, AUS, Glen M. Kohls, Major, Sn.C., AUS, and E. John Bell, Capt., Sn.C., AUS.	1121
Typhus Fever in Mexican Villages and Rural Populations Through the Use of DDT, Control of. Carlos Ortiz-Mariotte, M.D., M.P.H., Felipe Malo-Juvera, M.D., M.P.H., and George C. Payne, M.D., Dr.P.H.	1191

## U

Ulcerative Gingivostomatitis, Preliminary Considerations on the Epidemiology of. Vincent's Infection—A Wartime Disease. H. Trendley Dean, DDS, and Dennis E. Singleton, Jr., DDS.	433
Ulceromembranous gingivitis. See: Vincent's Infection.	
Ultra-violet Irradiation, Disinfection of Air by. Alexander Hollaender, Ph.D., Associate Referee. See: Report of the Committee on the Examination of Germicides and Antibacterial Agents	839
Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report. S. M. Wheeler, Lt. (MC), USNR, H. S. Ingraham, Lt. (MC), USNR, Alexander Hollaender, Ph.D., N. D. Lill, Lt. Comdr. (MC), USNR, J. Gershon-Cohen, Lt. Comdr. (MC), USNR, and E. W. Brown, Capt. (MC), USN.	457
UNRRA. See: Today's Global Frontiers in Public Health.	
U. S. Army. See: Health Programs Under Military Government. Brig. Gen. James S. Simmons, M.C., Col. Thomas B. Turner, M.C., and Col. Ira V. Hiscock, Sn.C.	35
U. S. Public Health Service. See: Public Health in the Reconversion Period. Thomas Parran, M.D.	987



	Page
U. S. Public Health Service to State and Local Health Units, Relationship of the. E. S. Tisdale . . . . .	625
Uses and Value of Industrial Vital Statistics. Ruth R. Puffer, Dr.P.H. . . . .	553
Utilization of Commercial Advertising for Health Education, Report of the Committee on. David Resnik, Chairman. . . . .	859
Utilizing Medical Social Service in a Venereal Disease Clinic. Margaret Lumpkin. . . . .	1185

## V

Value of Industrial Vital Statistics, Uses and. Ruth R. Puffer, Dr.P.H. . . . .	553
Value of Typing Meningococci. Sara E. Branham, Ph.D., M.D. . . . .	233
Vaughn, Reese H., and Stadtman, Thressa C. A Method for Control of Sanitation in Food Processing Plants . . . . .	1292
Venereal Disease Clinic, Utilizing Medical Social Service in a. Margaret Lumpkin. . . . .	1185
Venereal Disease Control, The Legal Basis for. James H. Lade, M.D. . . . .	1041
Venereal Disease, Does Health Education Prevent? The Army's Experience with 8,000,000 Men. Capt. Granville W. Larimore and Lt. Col. Thomas H. Sternberg. . . . .	799
Venereal Disease Epidemiology in Wartime. J. R. Heller, Jr., M.D. . . . .	1210
Venezuelan Equine Encephalomyelitis. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994
Veterans Administration. See: Industrial Hygiene and the Expanded Federal-State Vocational Rehabilitation Program. Dean A. Clark, Senior Surgeon (R), USPHS. . . . .	501
Veterans' Preference in Public Health Agencies of the United States. Declaration by the Committee on Professional Education. A.P.H.A. . . . .	253
Vincent's Infection—A Wartime Disease: Preliminary Considerations on the Epidemiology of Ulcerative Gingivostomatitis. H. Trendley Dean, D.D.S., and Dennis B. Singleton, Jr., D.D.S. . . . .	433
Observations on the Oral Spirochetal Flora Present in Vincent's Infection. Edward G. Hampp, D.D.S. . . . .	441
Reporting of Vincent's Infection by State Health Departments. Carl L. Sebellus, D.D.S., M.P.H. . . . .	451
Virus Encephalitides, Recent Advances in the Epidemiology of the Arthropod-borne. Including Certain Exotic Types. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D. . . . .	994
Visiting Nurse Service. See: Marriage Bells in Seattle. Editorial. . . . .	1321
Vital Statistics Division. See: Hats Off to the Census Bureau. Editorial. . . . .	381
Vital Statistics, Uses and Value of Industrial. Ruth R. Puffer, Dr.P.H. . . . .	553
Vocational Rehabilitation Program, Industrial Hygiene and the Expanded Federal-State. Dean A. Clark, Senior Surgeon (R), USPHS. . . . .	501
Voluntary Health Agency, A Challenge to the. Editorial. . . . .	1070
Voluntary Health Associations, Proposed Report on the Educational Qualifications of Executives of. Committee on Professional Education. W. P. Shepard, M.D., Chairman . . . . .	499

## W

Wagner Bill of 1915, The. Editorial. . . . .	824
Wakeman, Selman A., Associate Referee. Antibiotic Agents. See: Report of the Committee on Examination of Germicides and Antibacterial Agents. . . . .	839
Walsh-Healy Act. See: Industrial Hygiene and Labor. Herbert G. Dyktor. . . . .	480
War and the Birth Rate—A Brief Historical Summary. Louis I. Dublin, Ph.D. . . . .	315
War Department, Lessons Learned from the Internal Security Program of the. Lt. Col. W. H. Weir, Sn.C. . . . .	353
War on the Distribution of Full-time Local Health Officers, Effect of the. Burnet M. Davis, M.D., and Marion D. Altenderfer. . . . .	1047
Ward, Lt. Col. Thomas G., MC, AUS. Control Measures Against Importation of Disease by Men Returning from Overseas Duty. . . . .	572
Wartime Diet, Future Implications of the Nutritive Value of the American. Frank G. Boudreau, M.D. . . . .	243
War, Tuberculosis Mortality in England and Certain Other Countries During the Present. James A. Doull, M.D. . . . .	783
Waste Treatment and Control, Industrial. Loring F. Oeming. . . . .	722
Water and Sewage, Report of the Standard Methods Committee on Examination of. W. L. Mallmann, Ph.D., Chairman. . . . .	957
Water and Sewage, Standard Methods for the Examination of. Summary of Recommended Changes for the Ninth Edition. . . . .	1335
Water-borne Cysts of <i>Entamoeba histolytica</i> by Synthetic Detergents, Destruction of. Gordon M. Fair, Shih Luf Chang, Margery P. Taylor, and Margaret A. Wineman. . . . .	228
Water disinfection. See: Superchlorination and "Break-Point" Chlorination. Editorial. . . . .	733
Water Pollution. See: Industrial Waste Treatment and Control. Loring F. Oeming. . . . .	722
Water Purification. See: Bacteriological Improvements Obtained by the Practice of Break-Point Chlorination. A. E. Griffin, Ph.B., and N. S. Chamberlin. . . . .	199

	Page
Water Quality Control, Factors in Army. W. A. Hardenbergh, Colonel, Sn.C.....	361
Water Supplies in Foreign Areas, Army. Captain James B. Baty, Sn.C.....	347
Water Supply. See: Lessons Learned from the Internal Security Program of the War Department. Lt. Col. W. H. Weir, Sn.C.....	353
Water Supply, Report of the Committee on. Charles R. Cox, Chairman.....	743
Watt, James, Surgeon, USPHS. Practical Implications of the Epidemiology of the Diarrheal Diseases of the New-born. Streamlining Hospital Techniques.....	1205
Wedum, Arnold G., Ph.D., M.D., Beaglier, A. L., M.D., and Wedum, Bernice G., M.D. Prevalence of Rheumatic Heart Disease in Denver School Children.....	1271
Wedum, Bernice G., M.D., Wedum, Arnold G., Ph.D., M.D., and Beaglier, A. L., M.D. Prevalence of Rheumatic Heart Disease in Denver School Children.....	1271
Wegman, Myron E., M.D., and Bellows, Marjorie T. Indices and Standards for Child Health Services.....	715
Wegman, Myron E., M.D., Chairman. Symposium on Streamlining Hospital Techniques..	1196
Weil-Felix test. See: Applications of the Complement-Fixation Test in the Study of Rickettsial Diseases. Ida A. Bengtson, Ph.D.....	701
Weir, Lt. Col. W. H., Sn.C. Lessons Learned from the Internal Security Program of the War Department.....	353
Welch, Henry, Ph.D., Referee. Chemical Antiseptics. See: Report of the Committee on Examination of Germicides and Antibacterial Agents.....	839
Western Equine Type Encephalomyelitis. See: Recent Advances in the Epidemiology of the Arthropod-borne Virus Encephalitides. W. McD. Hammon, M.D., Dr.P.H., and W. C. Reeves, Ph.D.....	994
Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum, Successful Treatment of Experimental. Joseph Zichis, Ph.D., and Howard J. Shaughnessy, Ph.D....	815
Wheeler, S. M., Lt. (MC) USNR, Ingraham, H. S., Lt. (MC) USNR, Hollaender, Alexander, Ph.D., Lill, N. D., Lt. Comdr. (MC) USNR, Gershon-Cohen, J., Lt. Comdr. (MC) USNR, and Brown, E. W., Capt. (MC) USN. Ultra-violet Light Control of Air-borne Infections in a Naval Training Center. Preliminary Report.....	457
Whelpton, P. K. Effect of Increased Birth Rate on Future Population.....	326
Wide Significance of Nutritional Deficiency, The. Editorial.....	273
Wiehl, Dorothy G. Statistical Research in Clinical Tests for Nutritional Deficiencies....	1168
Wilson, Viktor O., M.D., M.P.H. The Point of View of the Public Health Physician. Streamlining Hospital Techniques.....	1202
Wineman, Margaret A., Fair, Gordon M., Chang, Shih Lu, and Taylor, Margery P. Destruction of Water-borne Cysts of Entamoeba Histolytica by Synthetic Detergents..	228
Winslow, C.-E. A., Dr.P.H. See: Changing Challenges of Public Health.....	191
Housing and Public Health. Landmarks of 1944.....	18
Wolman, Abel, Dr.Eng. Association Progress in 1944. Landmarks of 1944.....	1
Wolman, Abel, Dr.Eng., Chairman. Sanitary Engineering Report 8, National Research Council. Cross-connections and Back-siphonage Connections Under War Conditions..	637
World Task in Public Health, IV. The Immediate. Today's Global Frontiers in Public Health. James A. Crabtree, M.D.....	106
World War I and Tuberculosis. A Statistical Summary and Review. Godias J. Drolet..	689
Wuchereria bancrofti. See: Current Problems in Filariasis. H. W. Brown, M.D.....	607

## X

X-Ray. See: Tuberculosis.

## Z

Zichis, Joseph, Ph.D., and Shaughnessy, Howard J., Ph.D. Successful Treatment of Experimental Western Equine Encephalomyelitis with Hyperimmune Rabbit Serum..	815
Zimand, Savel. Tips and Tricks for the Practice.....	631